EN

Tank and swimming pool waterproofing system

Waterproofing, laying and grouting products in swimming pools for ceramics, slabs, marble, natural stone and mosaics.

LITOKOL®

This document provides guidelines for the correct design and application of waterproofing and installation of ceramic, porcelain stoneware, large slabs, marble, natural stone and glass or ceramic mosaics in tanks or swimming pools created from reinforced concrete, panels or disposable formwork, fibreglass or metal structures.
As these structures are in permanent contact with treated water, they must be waterproofed and protected from aggressive chemicals that would compromise their durability.

The ceramics industry currently provides a vast range of materials for the creation of highly aesthetically pleasing pools both in public and private settings.

Safeguarding the work begins with careful planning to ensure that the structure will remain watertight and retain its aesthetic and functional aspects in the long-term.

Contents

Main types of construction

1. Concrete structures

- Protection and waterproofing of external structure surfaces
- Sealing of cold joints, of structural joints and elements for the water recirculation system and filtration and illumination
- Substrate preparation
- Waterproofing inside the tank AQUAMASTER / ELASTOCEM / COVERFLEX / LITOPROOF EXTREME
- Watertight seal
- Adhesives and laying techniques
- Joint grouting
- Sealing the joints

2. Structures created with disposable formwork

- Grinding the surfaces
- Waterproofing the inner tank substrates AQUAMASTER / ELASTOCEM / COVERFLEX / LITOPROOF EXTREME
- Watertight seal
- Adhesives and laying techniques
- Joint grouting
- Sealing the joints

3.
Metal and fibreglass structures

Adhesives and laying techniques

Joint grouting

Sealing the joints

Waterproofing systems

AQUAMASTER

Ready-to-use liquid membrane in aqueous dispersion

ELASTOCEM

Trowleable, two-component cementitious mortar

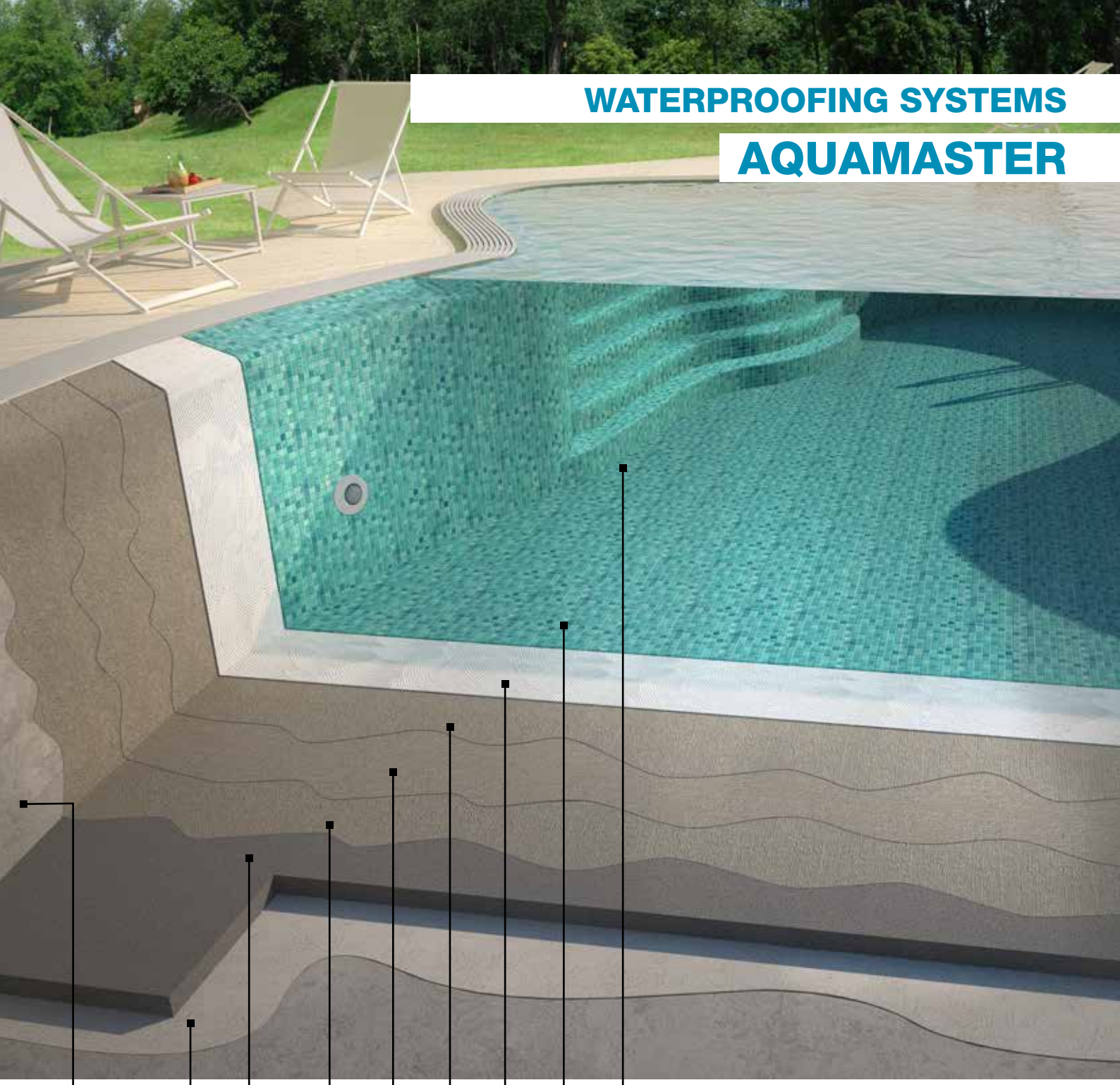
COVERFLEX

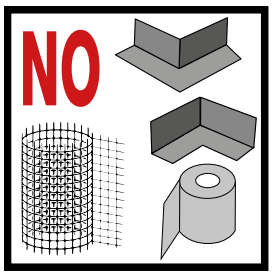
Two-component cementitious mortar applicable by roller, brush or trowel

LITOPROOF EXTREME

Membrane in rolls for under-tile waterproofing

AQUAMASTER


LITOPLAN SMART
IDROKOL X20-BASED ADHESIVE GROUT
LITOCEM / LITOCEM PRONTO SCREED
AQUAMASTER (FIRST COAT DILUTED WITH 10% WATER)
AQUAMASTER (SECOND COAT)
AQUAMASTER (THIRD COAT)
LITOPLUS K55
STARLIKE® EVO
OTTOPRIME 1218 + OTTOSEAL S70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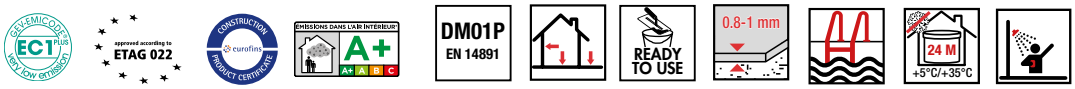
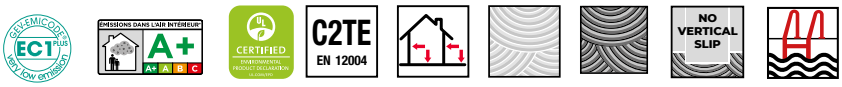
AQUAMASTER
Ready-to-use liquid membrane in aqueous dispersion, elastic at low temperatures, chlorine-resistant, for waterproofing indoor and outdoor wet areas, class DM 01P compliant with EN 14891.
Product with ultra-low emission of volatile organic compounds.

Consumption: 2.3 kg/m² per 1 mm thickness



LITOPLUS K55
High-performance, cementitious adhesive with zero vertical slip and extended open time for laying indoor and outdoor ceramic and porcelain tiles, mosaics and natural stones on floors and walls. Suitable for swimming pools, overlaying and heated floors. Product with ultra-low volatile organic compounds (VOC) emissions.

Consumption: 3.5 mm trowel: 1.8 kg/m² / 8 mm trowel: 3 kg/m² / Back-buttering: 5 kg/m²



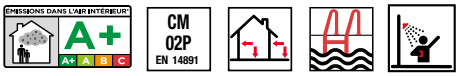
STARLIKE® EVO
Two-component, acid-resistant, epoxy mortar for the laying and grouting of all ceramic and porcelain tiles, ceramic and glass mosaics and natural stone, in swimming pools, class R2T (high-performance, reactive adhesive with zero vertical slip) compliant with EN 12004 and RG (reactive sealant) compliant with EN 13888.

WATERPROOFING SYSTEMS

ELASTOCEM

ELASTOCEM
Two-component, cementitious mortar applicable with smooth trowel, elastic up to -20°C, chlorine resistant, for under-tile waterproofing of wet indoor and outdoor environments such as bathrooms, balconies, terraces or pools. Compliant with class CM02P pursuant to EN 14891.

Consumption: 1.7 kg/m² per mm of thickness. Total consumption: 3.4 kg/m²



Litoband Sk Tape + Litoband Sk Corners IC / EC

Polypropylene fabric sealing with thermoplastic elastomer waterproof lining.

LITOMESH

Anti-alkaline, fibreglass reinforcement mesh.

Mesh dimensions: 4x5 mm.
Roll dimensions: Length = 50 m – Height = 1 m

LITOPLUS K55
High-performance, cementitious adhesive with zero vertical slip and extended open time for laying indoor and outdoor ceramic and porcelain tiles, mosaics and natural stones on floors and walls. Suitable for swimming pools, overlaying and heated floors. Product with ultra-low volatile organic compounds (VOC) emissions.

Consumption: 3.5 mm trowel: 1.8 kg/m² / 8 mm trowel: 3 kg/m² / Back-buttering: 5 kg/m²

STARLIKE® EVO
Two-component, acid-resistant, epoxy mortar for the laying and grouting of all ceramic and porcelain tiles, ceramic and glass mosaics and natural stone, in swimming pools, class R2T (high-performance, reactive adhesive with zero vertical slip) compliant with EN 12004 and RG (reactive sealant) compliant with EN 13888.

COVERFLEX


IDROKOL X20-BASED ADHESIVE GROUT
LITOCEM / LITOCEM PRONTO SCREED
COVERFLEX 1 COAT
LITOMESH
COVERFLEX 2 COAT
LITOBAND SK TAPE
LITOBAND SK IC
LITOPLUS K55
STARLIKE® EVO
OTTOPRIMER 1218 + OTTOSEAL S70

COVERFLEX

Two-component, cementitious mortar applied with roller, brush or trowel, elastic up to -20°C, chlorine resistant, for under-tile waterproofing of wet indoor and outdoor environments such as bathrooms, balconies, terraces or pools. Compliant with class CM02P pursuant to EN 14891.

Consumption: 1.6 kg/m² per mm of thickness. Total consumption: 3.2 kg/m²

Litoband Sk Tape + Litoband Sk Corners IC / EC

Polypropylene fabric sealing with thermoplastic elastomer waterproof lining.

LITOMESH

Anti-alkaline, fibreglass reinforcement mesh.

Mesh dimensions: 4x5 mm.
Roll dimensions: Length = 50 m – Height = 1 m

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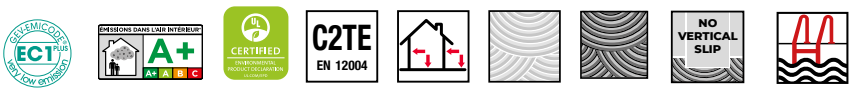
Consumption: 3.5 mm trowel: 1.8 kg/m² / 8 mm trowel: 3 kg/m² / Back-buttering: 5 kg/m²



STARLIKE® EVO
Two-component, acid-resistant, epoxy mortar for the laying and grouting of all ceramic and porcelain tiles, ceramic and glass mosaics and natural stone, in swimming pools, class R2T (high-performance, reactive adhesive with zero vertical slip) compliant with EN 12004 and RG (reactive sealant) compliant with EN 13888.

LITOPROOF EXTREME

LITOPROOF EXTREME

Membrane in rolls for under-tile waterproofing of balconies, terraces or pools. Composed of two layers of non-woven, polypropylene fabric, thermo-welded to a layer of polyethylene that ensures complete impermeability of the surfaces.

LITOBAND KOLL

Waterproof, rapid-hardening, elastic single-component adhesive sealant for the bonding and sealing of Litoband tape.
Consumption: 0.2 kg/m linear

Litoband Sk Tape + Litoband Sk Corners IC / EC

Polypropylene fabric sealing with thermoplastic elastomer waterproof lining.

LITOPLUS K55

High-performance, cementitious adhesive with zero vertical slip and extended open time for laying indoor and outdoor ceramic and porcelain tiles, mosaics and natural stones on floors and walls. Suitable for swimming pools, overlaying and heated floors. Product with ultra-low volatile organic compounds (VOC) emissions.

Consumption: 3.5 mm trowel: 1.8 kg/m^2 / 8 mm trowel: 3 kg/m^2 / Back-buttering: 5 kg/m^2

STARLIKE® EVO

Two-component, acid-resistant, epoxy mortar for the laying and grouting of all ceramic and porcelain tiles, ceramic and glass mosaics and natural stone, in swimming pools, class R2T (high-performance, reactive adhesive with zero vertical slip) compliant with EN 12004 and RG (reactive sealant) compliant with EN 13888.

1. Concrete structures

To guarantee that the structure lasts, careful thought must be given, during the design phase, to the site where the work will be carried out and the kind of structure to be created. This is necessary to identify the most suitable type of cement, among the many available on the market, to make sure that the pool lasts as long as required.
The UNI EN 206-1 and UNI 11104 standards describe in detail the parameters for structural calculations and measures to be taken depending on target environments, such as for example:

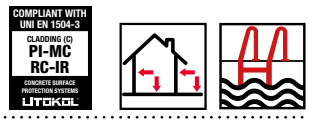
Adequate thickness of concrete cover
Strength class of concrete
Environmental exposure class
Consistency class of concrete
Maximum nominal aggregate size (ø MAX)

Protection and waterproofing of external structure surfaces

Concrete, even if properly made in line with the above-mentioned criteria, is still subjected to the action of aggressive substances which, over time, can cause the structure to deteriorate.
In fact, both the water in the ground (in the case of in-ground structures) and the water inside the tank contain these substances which, by penetrating the structure, compromise its durability.
An important aspect to consider when designing in-ground pools is, therefore, the water table.
This test will allow you to correctly define the best type of foundation and the best waterproofing system.
For example, bentonite sheets can be used for pre-cast waterproofing of horizontal surfaces.
This material expands when it comes into contact with moisture and so, creates a waterproof and protective layer which adheres to the surface.
Post-cast waterproofing of external walls can be achieved by applying the same bentonite sheets to the surface, or by using a roller, brush or smooth trowel to apply a mortar with osmotic action such as Osmogrout for a thickness of at least 3 mm applied in two successive coats.
Once properly cured, the Osmogrout layer must be protected by the insertion of a drainage layer.

OSMOGROUT
Cementitious mortar with osmotic action for waterproofing, with direct or indirect load on walls and cement-based structures indoors and outdoors.

Consumption: 1.6 kg/m^2 per 1 mm thickness

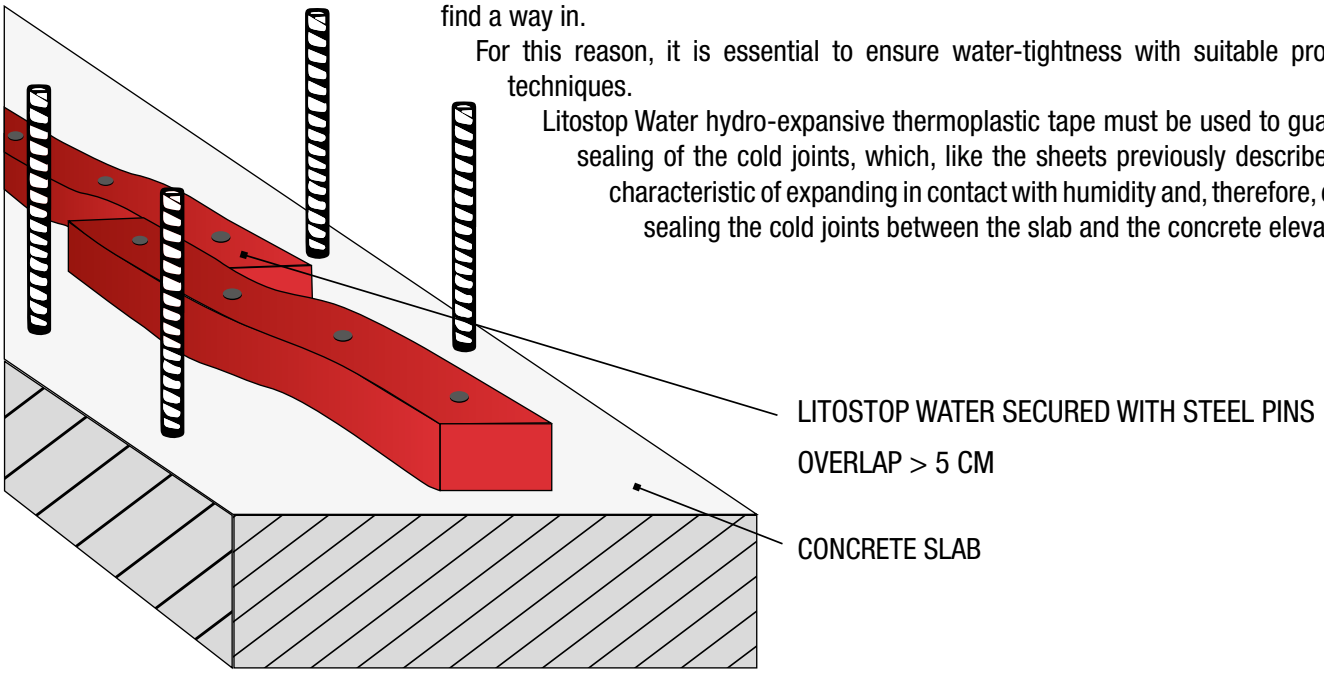


Sealing of cold joints, of structural joints and elements for water recirculation system and filtration and illumination

The above-mentioned elements are points of discontinuity in the structure where the water can find a way in.

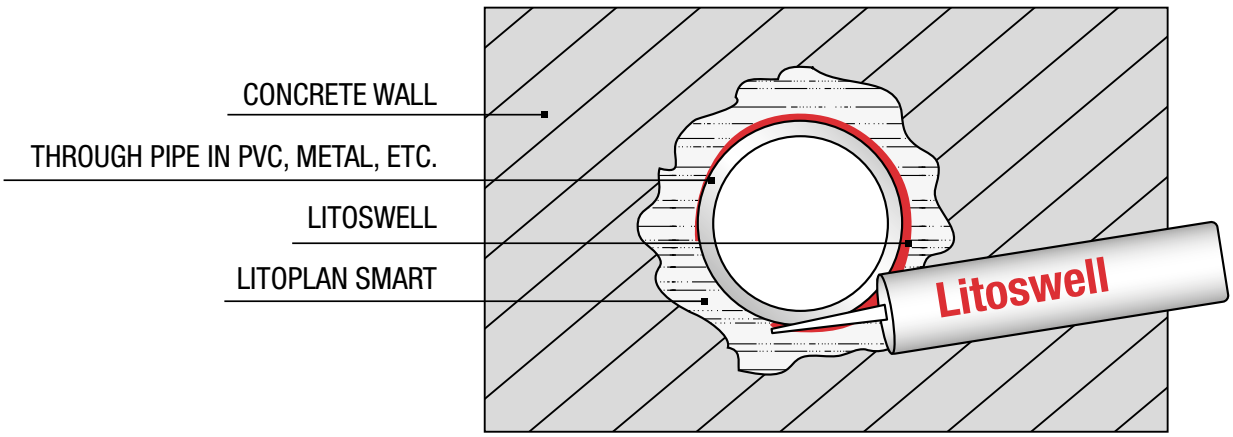
For this reason, it is essential to ensure water-tightness with suitable products and techniques.

Litostop Water hydro-expansive thermoplastic tape must be used to guarantee the sealing of the cold joints, which, like the sheets previously described, has the characteristic of expanding in contact with humidity and, therefore, completely sealing the cold joints between the slab and the concrete elevation walls.



Any structural joints (mainly created in large tanks such as 50m Olympic-size swimming pools) must be waterproofed with suitable TPE (thermoplastic elastomer) sealing tapes of 1 mm thickness and bonded to the edges with two layers of Multifondo EVO.

Spread dry quartz on the second layer of Multifondo EVO while still fresh to improve adhesion of subsequent waterproofing layers. Excess quartz must be removed before applying the waterproofing membranes.
For the sealing of through pipes, water recirculation or filtration accessories, as well as for light fittings, after creating a split around these elements, a single-component, hydro-expansive cartridge sealant – such as our Litoswell – must be applied to the bottom of the split to seal the interface between the through elements and the concrete structure.
Complete filling of the recess is then carried out using Litoplan Smart rapid-hardening, controlled-shrinkage cementitious mortar.



LITOSTOP WATER

Thermoplastic hydro-expansive tape for the casting of concrete cold joints.

LITOSWELL

Hydro-expansive, polymer sealant in cartridges, for sealing and waterproofing through pipes in concrete, lights, inlets and drains in swimming pools or tanks.

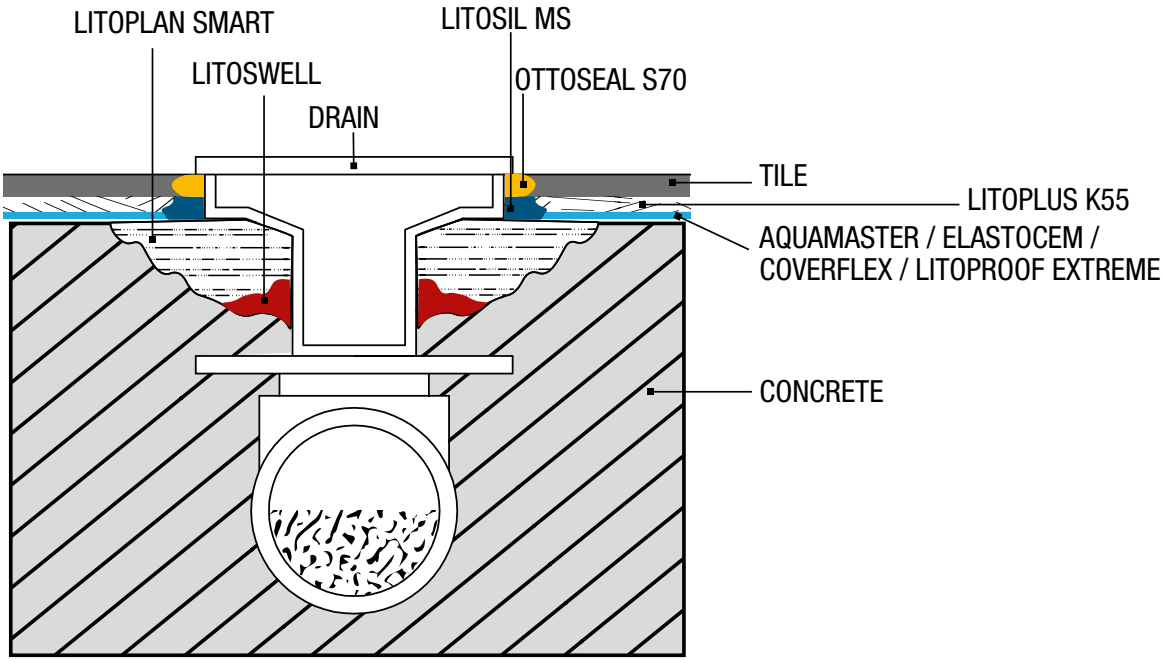
MULTIFONDO EVO

Structural epoxy primer with high elasticity and adhesion

ZHERORISK EVOLUTION TECHNOLOGY

LITOSIL MS

Multi-purpose waterproof elastic adhesive sealant.



Substrate preparation

The methods and products indicated to level the inner horizontal and vertical surfaces are described in this section. The first task is to clean the concrete surfaces using a pressure hose to eliminate all the uneven parts, any surface bleeding, any form-release agent residue or anything else which may prevent the product to be applied from adhering.
The bottom of the tank is levelled by creating an adherent screed which guarantees a sufficiently resistant substrate.
Litokol suggests Litocem Pronto, a pre-mixed, standard setting mortar, which when mixed with water, creates rapid-drying indoor and outdoor screeds with controlled shrinkage in class C30-F6 in compliance with the EN 13813 standard.
To create an adhering screed, it must be applied to the concret base a bonding slurry which consists of 3 parts by weight of Portland cement + 1 part by weight of water + 1 part by weight of Idrokol X20 (latex in aqueous dispersion) using a brush, and then the screed based on Litocem Pronto should be cast wet-on-wet.

ZavattiShop Structures

LITOCEM PRONTO
Premixed ready-for-use normal-setting fast-drying controlled shrinkage mortar for indoor and outdoor screeds.
Product with ultra-low volatile organic compounds (VOC) emissions.

Consumption: 18-20 kg/m² per cm of thickness

If the thickness to be levelled on the base is less than 10 mm or if slopes are required, Litoplan Smart smoothing compound can be used.
For wall levelling, use Litoplan Smart, a rapid-hardening and drying, thixotropic cementitious smoothing compound for indoor and outdoor applications in thicknesses ranging from 1 to 25 mm, class C16-F5 in compliance with to EN 13813.

Litoplan Smart is a particularly versatile product as it can easily be applied directly onto the concrete substrate without adding latex in aqueous dispersion, allowing successive steps to be completed quickly due to its rapid hardening and drying characteristics.

When necessary, such as when laying mosaics, the surface of the smoothing compound may be rubbed down with a damp sponge as soon as the product has begun to set.

LITOPLAN SMART

Cementitious thixotropic levelling layer featuring rapid hardening and drying for vertical or horizontal applications, indoors and outdoors, in a range of thicknesses from 1 to 25 mm.
Product with ultra-low volatile organic compounds (VOC) emissions.

Consumption: 1.6 kg/m^2 per 1 mm thickness

Waterproofing inside the tank

Once the surfaces have been ground and the time allowed for the products to dry and cure, the surfaces may be waterproofed. Litokol provides 4 different waterproofing systems.

AQUAMASTER

Advantages

✓ELASTIC – The high level of elasticity of Aquamaster, unlike normal single- or two-component cementitious waterproofing membranes, is such that there is no need to insert a Litomesh anti-alkaline fibreglass reinforcement mesh and sealing tapes to reinforce the corners of the structure.

✓ECONOMICAL – Reduced product application time and significant savings in terms of cost.

✓INNOVATIVE – Not requiring the use of reinforcement mesh and tapes means that it is easier to waterproof complex structures with round surfaces where the correct insertion of reinforcing elements would be difficult.

✓EASE OF USE – Aquamaster is a ready-to-use product and requires no preparation, aviding mistakes during the mixing process.

✓ECO-SUSTAINABLE – Reusable: Aquamaster's binder is a polymer resin in aqueous dispersion that crosslinks by evaporation of water during application in much the same way as ordinary water-based wall paint. This characteristic means the product can be reused if stored in the closed, original packaging and protected from frost, thereby avoiding unnecessary waste.

✓SAFE – Contains no solvents, is non-flammable and has an ultra-low emission of volatile organic compounds, in compliance with class A+ (Émission dans l'air intérieur – French Regulations) and class EC1^{PLUS} in compliance with the EMICODE protocol.

✓RAPID – The drying time of the product is particularly rapid and allows the application of several layers in a short time frames.

✓CERTIFIED – The product is classified DM01P in compliance with European standard EN 14891 and complies with the requirements of ETAG 022 part 1.

The first coat must be applied with a long pile roller or brush and the product diluted with 10% water.
The product thus becomes very fluid, like a primer, and fills the pores of the cementitious substrate, preventing bubbles from appearing in successive coats.
Once the first coat has dried (approx. 30 minutes at a temperature of +23°C), the second coat may be applied undiluted using a long pile roller, brush or smooth steel trowel.

When the second layer has dried (approx. 4 hours at a temperature of +23°C), the third and final layer may be applied forming a total thickness of 0.8 to 1 mm of dried material.
Waterproofing must be interrupted with the occurrence of any pipes, drains or elements related to lighting, and a joint created between the membrane and the aforementioned elements, using the ready-to-use cartridge adhesive-sealant Litosil MS, based on MS polymer.
This ensures a complete waterproofing seal with the occurrence of elements that create a discontinuity in the waterproof covering.

ELASTOCEM

Advantages

✓ELASTIC – Product features ultra-high elasticity and impermeability. It retains its flexibility even at very low temperatures (-20°C), making it suitable for applications in particularly cold areas.

✓FIBRE-REINFORCED – The inclusion of polypropylene fibres provides additional reinforcement to the mortar.

✓FIRM – Outstanding adhesion on concrete, on any cementitious substrate and on smooth, compact and non-absorbent substrates such as ceramic and porcelain tiles, natural stone, even when polished, with no need for a primer.

✓SAFE – Product with ultra-low emission of volatile organic compounds in compliance with Class A+ (Émission dans l'air intérieur – French Regulations)

✓CERTIFIED – The product is classified CM02P in compliance with EN 14891

The product requires the insertion, between the first and second coat, of Litomesh anti-alkaline, fibreglass reinforcement mesh and sealing Litoband SK Tape at the trims between horizontal and vertical or adjoining surfaces of the structure.
The Litoband SK Tape junction between the horizontal and vertical corners of the structure is fortified by the insertion of special Litoband SK IC (internal corners) and EC (external corners) trims.

When using this system, the first task to carry out is the waterproofing of all the horizontal and vertical joints of the structure.
Apply Elastocem evenly in the corners and glue the Litoband SK Tape wet on wet, applying sufficient pressure and avoiding bubbles or creasing.
To join the Litoband SK Tape with the special elements for the inner and outer corners, the tape must overlap the special elements by a few centimetres, binding them with Elastocem.

Once waterproofing all the connections is complete, waterproofing of the surfaces can begin by applying the first coat of Elastocem with a smooth steel trowel, with the insertion of a wet-on-wet anti-alkaline, reinforced fibreglass mesh with 4 x 4.5 mm mesh, weighing 150 g/m^2.
When laying the mesh, make sure no bumps are formed and overlap the rolls by at least 10 cm.

After the first coat has dried (approx. 4-6 hours at a temperature of +23°C), the second coat may be applied, completely covering the tapes and fibreglass mesh to a total thickness of at least 2 mm.

Waterproofing must be interrupted with the occurrence of any pipes, drains or elements related to lighting, and a joint created between the membrane and the aforementioned elements, using the ready-to-use cartridge adhesive-sealant Litosil MS, based on MS polymer.
This ensures a complete waterproof seal with the occurrence of elements that create a discontinuity in the waterproofing membrane.

COVERFLEX

Advantages

✓VERSATILE – Due to its particularly fine grain size and 2:1 powder/latex ratio, it can also be applied with a long pile roller or brush as well as a smooth steel trowel.
✓ELASTIC – Ultra-high level of elasticity and impermeability. It retains its flexibility even at very low temperatures (-20°C), making it suitable for applications in particularly cold areas.
✓RAPID – Rapid implementation times. Ideal for large surfaces or complex structures that make it difficult to apply with a smooth trowel.
✓FIRM – Outstanding adhesion on concrete, on any cementitious substrate and on smooth, compact and non-absorbent substrates such as ceramic and porcelain tiles, natural stone, even when polished, with no need for a primer.
✓SAFE – Product with ultra-low emission of volatile organic compounds in compliance with Class A (Émission dans l'air intérieur – French Regulations)
✓CERTIFIED – The product is classified CM02P in compliance with EN 14891

The product requires the insertion, between the first and second coat, of Litomesh anti-alkaline, fibreglass reinforcement mesh and sealing Litoband SK Tape at the trims between horizontal and vertical or adjoining surfaces of the structure.
The Litoband SK Tape junction between the horizontal and vertical corners of the structure is fortified by the insertion of special Litoband SK IC (internal corners) and EC (external corners) trims.
When using this system, the first task to carry out is the waterproofing of all the horizontal and vertical joints of the structure.
Apply Coverflex evenly in the corners and bond the Litoband SK Tape wet on wet, applying sufficient pressure and avoiding bubbles or creasing.
To join the Litoband SK Tape with the special elements for the inner and outer corners, the tape must overlap the special elements by a few centimetres, binding them with waterproofing mortar.

Once waterproofing all the connections is complete, waterproofing of the surfaces can begin by applying the first coat of Coverflex, inserting wet-on-wet the Litomesh anti-alkaline, reinforced fibreglass mesh with 4 x 4.5 mm mesh, weighing 150 g/m^2.
When laying the mesh, make sure no bumps are formed and overlap the rolls by at least 10 cm.
After the first coat has dried (approx. 4-6 hours at a temperature of +23°C), the second coat may be applied, completely covering the tapes and fibreglass mesh to a total thickness of at least 2 mm.

Waterproofing must be interrupted with the occurrence of any pipes, drains or elements related to lighting, and a joint created between the membrane and the elements, using the ready-to-use cartridge adhesive-sealant Litosil MS, based on MS polymer. This ensures a complete waterproof seal with the occurrence of elements that create a discontinuity in the waterproofing membrane.

LITOPROOF EXTREME

Advantages

✓GUARANTEED – Guarantees optimum waterproofing safety due to the constant thickness.

✓ELASTIC – Retains its elasticity even at very low temperatures (-30°C)

✓RAPID – Easy and rapid installation. Thanks to the centimetre markings on the edges it allows the rolls to be perfectly aligned. No waiting time before laying coverings.

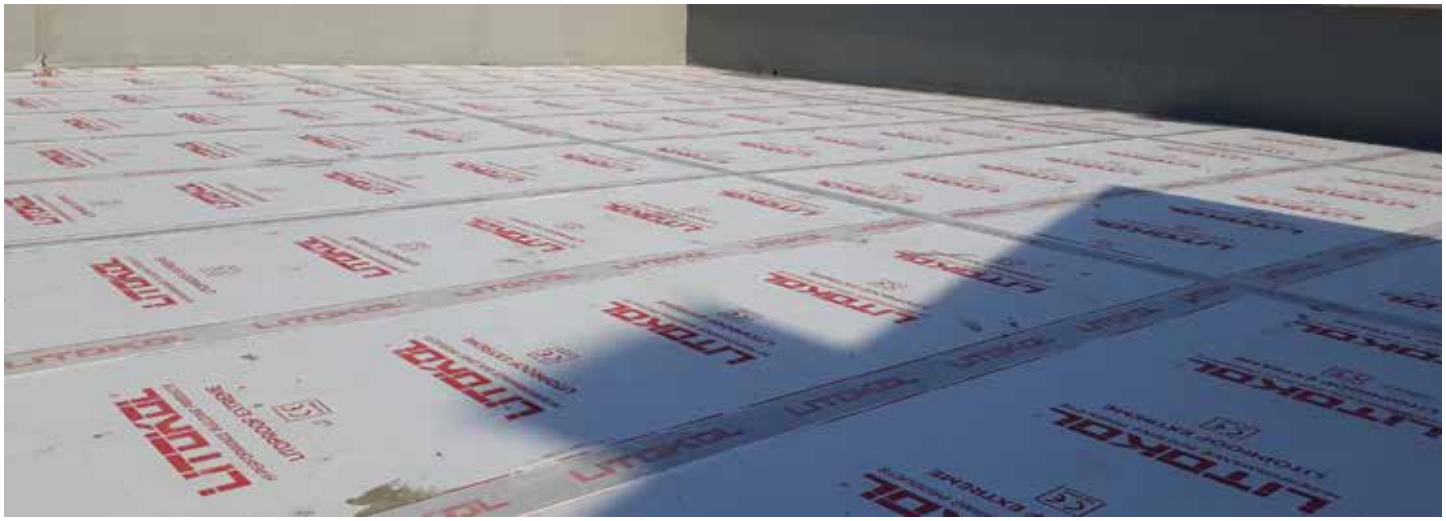
✓REFLECTIVE – The white colour provides good solar reflectance, preventing the surface from overheating before the laying of ceramics on sunny, summer days

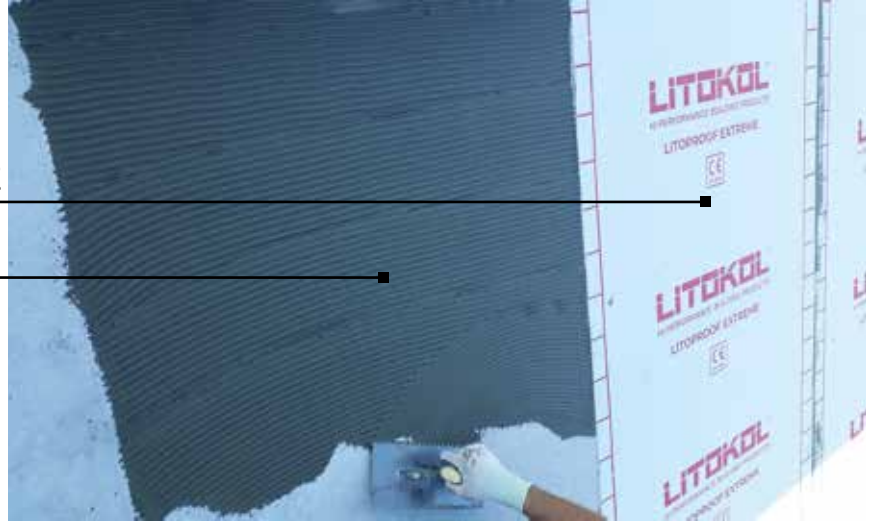
✓SAFE – Product with ultra-low volatile organic compounds (VOC) emission rate. Conforms to EC1^{PLUS} class according to EMICODE protocol and A+ class (Émission dans l'air intérieur – French Regulations)

✓CERTIFIED – Product complies with the requirements of European standard EN13956

The substrates must be completely flat and smooth prior to waterproofing to ensure easy laying of the sheet.
When bonding, use a class C2, cementitious adhesive compliant with EN 12004 like Litoplus K55 on the substrate, with a 3.5 mm notched trowel.
Lay the Litoproof Extreme sheet observing the open time of the adhesive, pressing down with a round-edged, smooth trowel or hand roller from the centre outwards, allow the excess adhesive to escape and avoiding the formation of creasing or bubbles.
The sheets must be laid side by side with a maximum distance of 2-3 mm between them, using centimetre edging for correct positioning.

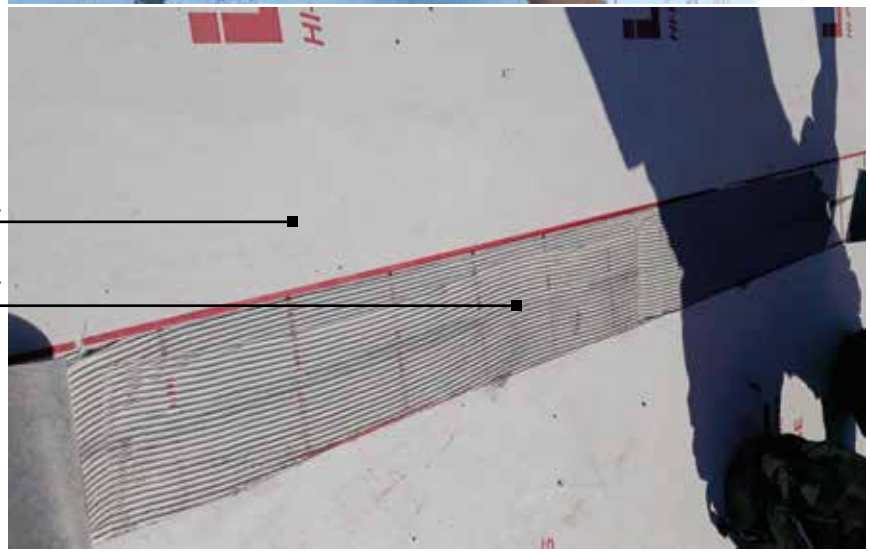
Seal the joints between the sheets with Litoband SK Tape, bonding it to the sheet with Litoband Koll rapid-hardening, single-component waterproofing adhesive, applied using a notched 3.5 x 3.5 mm trowel.
After applying the adhesive, apply the Litoband SK Tape using a smooth rounded-edged steel trowel, avoiding the formation of creasing or bubbles.
Apply Litoband SK IC and Litoband SK EC on any internal or external corners using Litoband Koll.
Cut the Litoproof Extreme membrane to size at any drains, pipes or lights and seal the joint with a ready-to-use cartridge adhesive-sealant Litosil MS, based on MS polymer.





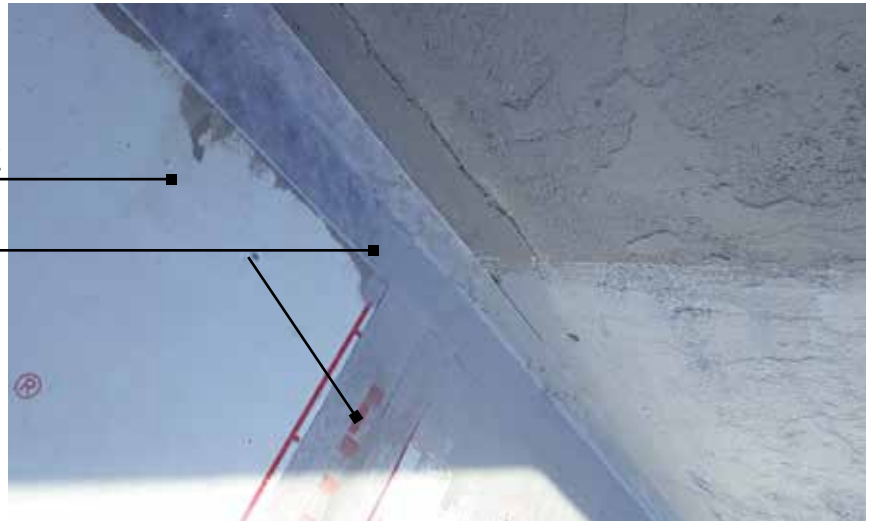
LITOPROOF EXTREME

LITOPLUS K55



LITOPROOF EXTREME

LITOBAND KOLL



LITOPROOF EXTREME

LITOBAND SK TAPE

Adhesives and laying techniques

Before mosaic or tile installation, it is advisable to check the watertight seal of the tank and, after the waterproofing membrane has dried completely, the tank can be filled.
After checking the water tightness and verifying that the waterproofing has been done correctly, the tank can be emptied and once dried, the adhesive can be laid.

Laying of ceramics, slabs, natural stone or marble in swimming pools requires a full bed of adhesive to ensure durability of the tiling, which may be achieved using the back-buttering.
This technique consists of applying the adhesive mortar to both the substrate and the back of the tiles, preventing any air pockets in the adhesive layer.
The ceramic and porcelain tiles must be laid with grout lines in proportion to their size. Butt joints are not allowed.
Any plastic spacers must be removed before grouting.
It is, therefore, recommended that national regulations currently in force in each country be carefully read, for example UNI 11493:2013 for Italy, which provides all necessary instructions regarding the choice of materials, correct planning, use and installation, so as to ensure all quality, performance and durability standards are safely met.

Check that the material chosen for the installation is suitable for the use envisaged.
In the case of glass mosaics laid on mesh and ceramic and porcelain tiles or natural stone with reinforced backing, consult the manufacturer to ensure that they are suitable for use in swimming pools and that they are compatible with the products used to install them.

LITOPLUS K55

Advantages

✓ Single-component product suitable for laying mosaics, porcelain and ceramic tiles in swimming pools, by simply mixing with water with no addition of latex.
✓ Fine grain size, making it suitable for laying glass mosaics using 3.5 mm notched trowels.
✓ The special additives contained in the product provide excellent creaminess and smoothness to the mixture applied with a notched trowel.
✓ The adhesive mortar features excellent thixotropy characteristics, allowing ceramic tiles and mosaics to be laid on walls with no need for plastic spacers.
✓ Product with ultra-low volatile organic compounds (VOC) emission rate. Conforms to EC1^{PLUS} class according to EMICODE protocol and A+ class (Émission dans l'air intérieur – French Regulations)

LITOPLUS K55
High-performance, cementitious adhesive with zero vertical slip and extended open time for laying indoor and outdoor ceramic and porcelain tiles, mosaics and natural stones on floors and walls. Suitable for swimming pools, overlaying and heated floors. Product with ultra-low volatile organic compounds (VOC) emissions.

Alternatively, it is possible to use Hyperflex K100 super white, highly deformable, thixotropic and extended open time cementitious adhesive, classified C2TES2, in compliance with EN12004.
Or Superflex K77 cementitious adhesive, deformable, thixotropic, classified C2TE S1, in compliance with EN12004.

HYPERFLEX K100
High-performance, no vertical slip, highly deformable cementitious adhesive with Dust Reduction action and extended open time for laying ceramic and porcelain tiles and large format, moisture-stable natural stone, glass and ceramic mosaic tiles, on walls and floors, indoors and outdoors. Suitable for thin, fibre-reinforced slabs, installation over existing substrates and on heated floors. Product with ultra-low volatile organic compounds (VOC) emissions.

SUPERFLEX K77
High-performance cementitious adhesive with deformation ability, no vertical slip and extended open time for the installation of ceramic and porcelain tiles, porcelain stoneware and natural stone in large sizes, vitreous and ceramic mosaics on indoor and outdoor floors and walls. Suitable for overlaying and heated floors. Product with Litokol Dust Reduction technology. Product with ultra-low volatile organic compounds (VOC) emissions.

When laying metallic items that are sensitive to the highly alkaline pH of cement or when laying transparent mosaics, it is advisable to use the flexible, reactive two-component adhesive Litoelastic EVO, which prevents colour variations and oxidation in types of claddings.

LITOELASTIC EVO
High-performance, white, two-component reactive adhesive for laying floors and walls indoors and outdoors of any type of ceramic and porcelain tiles, including reinforced thin slabs, mosaics, natural and reconstituted stone, even on non-traditional substrates, such as wood, metal or fibreglass. Suitable for installations over existing tiles, on heated floors and in pools. Product with ultra-low volatile organic compounds (VOC) emissions.

Grouting

The swimming pool is an environment that is continuously exposed to chemical aggression due to the presence of sanitising substances in water such as chlorine, pH regulators, anti-algae products, flocculants, etc.
This is why Litokol recommends the use of Starlike® EVO for grouting joints.
The product, classified as RG (reactive grout sealant) in compliance with EN 13888, features elevated chemical and mechanical resistance, complete adhesion on the sides of tiles or mosaics and zero absorption, which makes the grout completely impermeable, contributing to the protection of the underlying layers.
Compared to traditional cementitious grouts, it ensures greater durability of the work and drastically reduces maintenance.
Starlike® EVO epoxy mortar is also particularly suitable for repairing damaged grouting in existing installations.

STARLIKE® EVO

Advantages

✓ Starlike® EVO is available in 41 colours and can, therefore, meet all aesthetic needs.

✓ Extremely easy application and cleaning, even compared to traditional cementitious grouts. Prevents the release of colour pigments onto ceramic surfaces.

✓ Bacteriostatic product which prevents the proliferation of fungi and moulds.

✓ The extreme fineness of the sintered quartz micro granules makes it possible to obtain highly smooth and compact finishes.

✓ Stable and uniform colouring for all types of tiles with exclusive chromatic effects.

✓ Elevated mechanical and chemical resistance.

✓ UV Resistant

✓ It is non-absorbent, making it easier to clean the grout, especially in harsh operating conditions such as swimming pools.

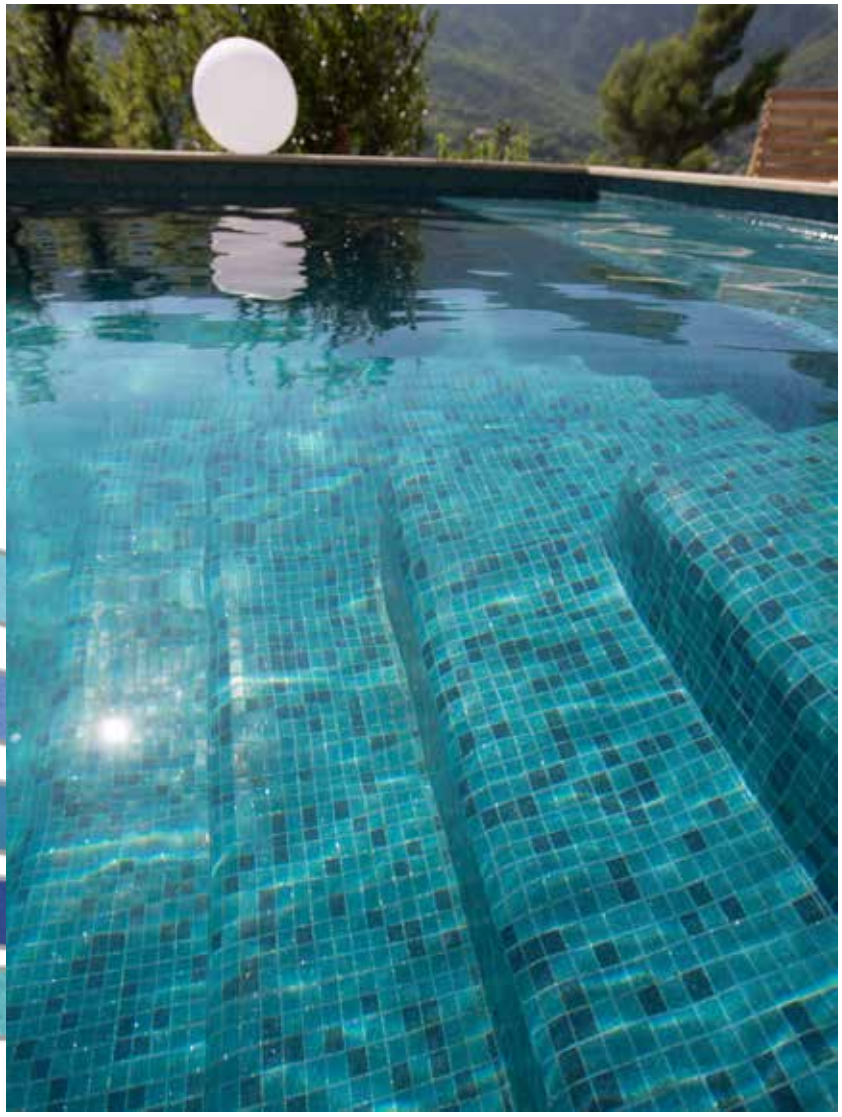
✓ Total absence of cracking or cavitation following hardening

✓ Unlike other epoxy mortars on the market, the catalyst (part B) in Starlike® EVO is labelled only as an irritant. It is neither corrosive nor hazardous for the environment.

✓ Starlike® EVO is not classified in the hazardous item category and is, therefore, exempt from transportation restrictions (ADR-ADN-IMDG-IATA classes).

✓ Product with ultra-low volatile organic compounds (VOC) emission rate. Conforms to EC1^{PLUS} class according to EMICODE protocol and A+ class (Émission dans l'air intérieur – French Regulations)

If transparent, epoxy resin halos remain on the surface of the cladding after grouting with Starlike® EVO, they can be removed using Litonet EVO or Litonet Gel Evo cleaner 24-48 hours after grouting has been carried out.



STARLIKE® EVO

GROUTCOLLECTION

class COLDCOLLECTION

STARLIKE® EVO


100 Bianco assoluto


102 Bianco Ghiaccio


105 Bianco Titanio


110 Grigio Perla


115 Grigio Seta


120 Grigio Piombo


125 Grigio Cemento


130 Grigio Ardesia


140 Nero Grafite


145 Nero Carbonio

class WARMCOLLECTION

STARLIKE® EVO


200 Avorio


202 Naturale


205 Travertino


208 Sabbia


210 Greige


215 Tortora


225 Tabacco


230 Cacao


232 Cuoio


235 Caffè

Glam COLLECTION

STARLIKE® EVO


300 Azzurro Pastello


310 Azzurro Polvere


320 Azzurro Caraibi


330 Blu Avio


340 Blu Denim


350 Blu Zaffiro


400 Verde Salvia


410 Verde Smeraldo


420 Verde Prato


430 Verde Pino


500 Rosa Cipria


530 Viola Ametista


550 Rosso Oriente


580 Rosso Mattone


600 Giallo Vaniglia

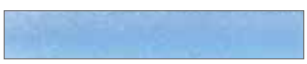
STARLIKE® CRYSTAL EVO


700 Crystal

STARLIKE® ColorCrystal EVO

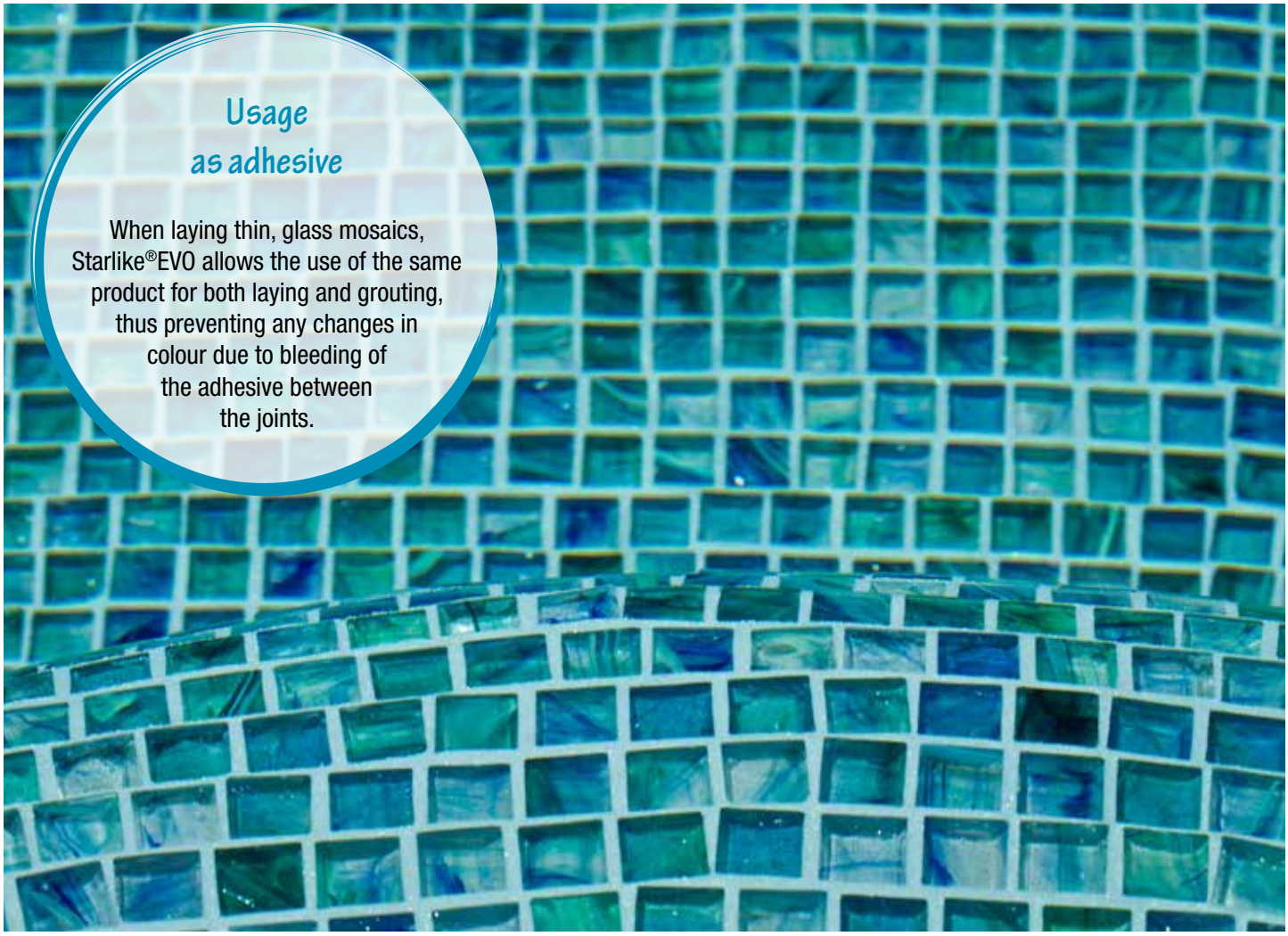

800 Grigio Oslo


810 Verde Capri


820 Azzurro Taormina


825 Beige Havana


830 Rosa Kyoto



Usage as adhesive

When laying thin, glass mosaics, Starlike®EVO allows the use of the same product for both laying and grouting, thus preventing any changes in colour due to bleeding of the adhesive between the joints.

STARLIKE® EVO
Two-component, acid-resistant, epoxy mortar for the laying and grouting of all ceramic and porcelain tiles, ceramic and glass mosaics and natural stone, in swimming pools, class R2T (high-performance, reactive adhesive with zero vertical slip) compliant with EN 12004 and RG (reactive grout) compliant with EN 13888.

ZHERORISK EVOLUTION TECHNOLOGY · EMICODE EC1 PLUS VERY LOW EMISSION · A+ · CERTIFIED · RG EN 13888 · R2T EN 12004 · 0474 · 1-15 mm · 1/32" 5/8" · UV RESISTANT · WATERPROOF · 24 M · +5°C /+35°C · PATENTED

LITONET EVO / LITONET GEL EVO
Liquid detergents for the removal of epoxy grout stains and residue from all types of ceramic and porcelain tiles, mosaics and natural stone.

Consumption: 10 - 15 m²/l

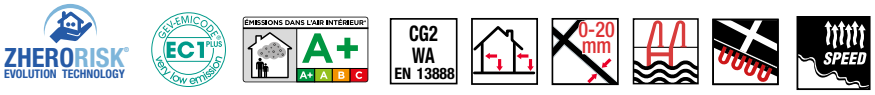
ZHERORISK EVOLUTION TECHNOLOGY

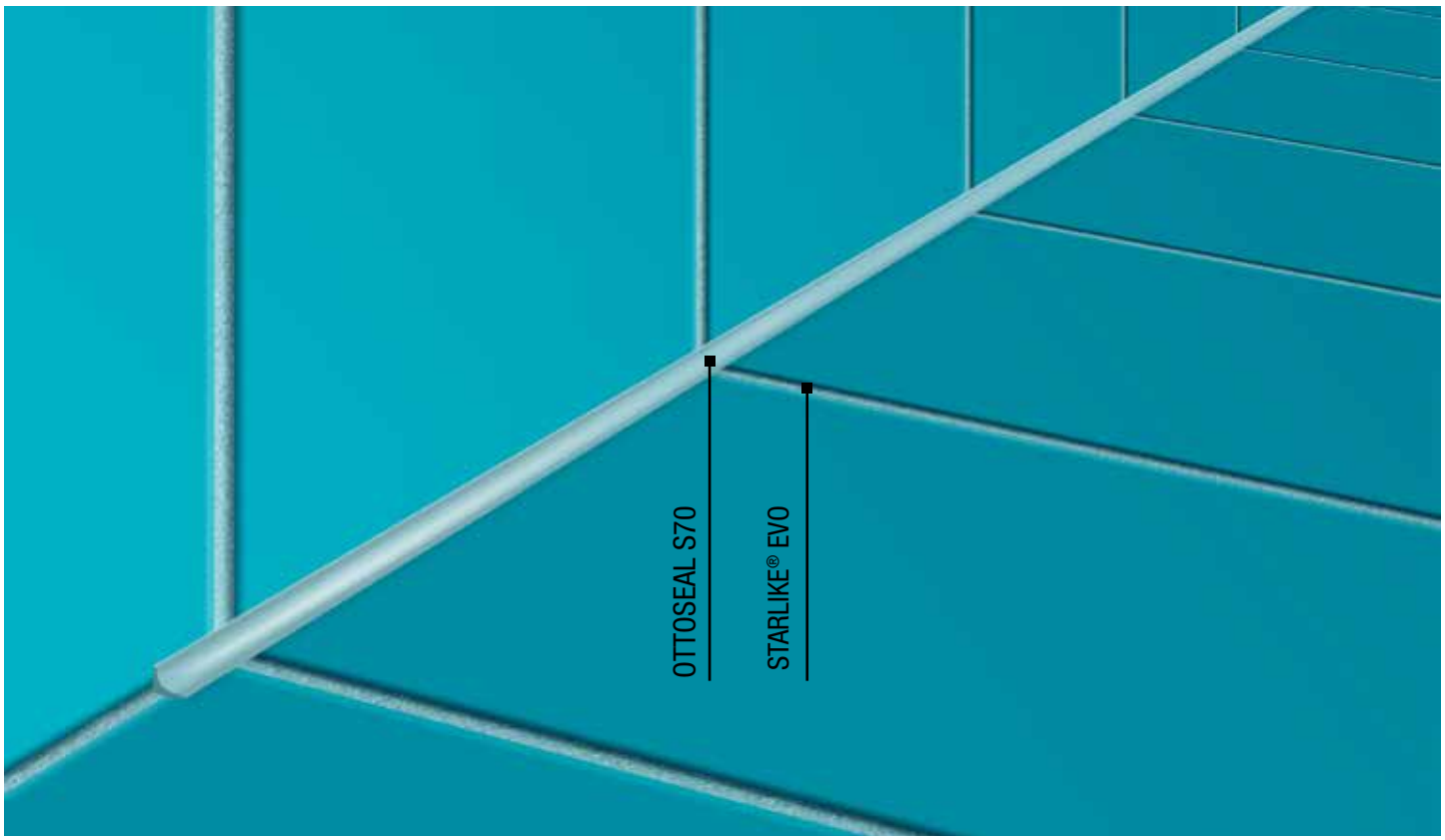
Alternatively, use can be made of EpoxyÉlite Evo, two-component, acid-resistant epoxy mortar, available in 8 different colours or Stylegrout tech or Stylegrout 0-8 high-performance cementitious grouts, available in 20 designer colours.

EPOXYÉLITE EVO
Two-component, acid-resistant epoxy mortar for laying and grouting ceramic and porcelain tiles and mosaics with joints from 1 to 15 mm wide on indoor and outdoor floors and walls.
Product with ultra-low volatile organic compounds (VOC) emissions.

STYLEGROUT 0-8
High-performance, cementitious grout for the grouting of joints from 0 to 8 mm on ceramic and porcelain tiles, porcelain stoneware, mosaics or natural stone. Ideal for smooth and compact grouting.
Product with ultra-low volatile organic compounds (VOC) emissions.

STYLEGROUT TECH
Flexible, multi-purpose cementitious grout for the grouting of joints of up to 20 mm on ceramic and porcelain tiles, porcelain stoneware, slabs, mosaics or natural stone. Water-repellent, anti-efflorescence with high colour-fast properties, keeps the joint full and even. Product with ultra-low volatile organic compounds (VOC) emissions.





Sealing the joints

In order to accommodate any stabilisation or structural movements which may affect the tank, expansion joints must be created at the corners or edges of the tank.
Elastic grouting should also be created at any divider joints for the screed.
In expansion joints involving only ceramic tiles, where there is no space available to insert a Litogap gasket, a polyethylene film should be applied to prevent the sealant from adhering to the base of the joint.
The sealant must be able to move freely between the two sides of the joint to compensate the traction and compression movements. Consequently, the sealant must be free to move on the lower side, if not, cracks or cuts could appear causing the sealant to tear and detach.

OTTOSEAL S70

Joints are sealed with neutral, cross-linked silicone Ottoseal S70.
The product is available in a variety of colours that can be matched to Starlike® EVO colours and is particularly resistant under continuous immersion and in contact with sanitising substances present in swimming pool water.

To improve sealing and durability of the elastic sealant based on OttoseaL S70, application of Ottoprimer 1218 on the sides of the joint is recommended.

OTTOSEAL S70
Single component, neutral cross-linked silicone sealant.

Consumption: 5 x 5 mm butt joint ■ approximately 12 linear metres per cartridge.
5 x 5 mm corner joint ◢ approximately 25 linear metres per cartridge.

OTTO PRIMER 1218
Solvent-based, single-component synthetic resin solution based on the silicone-acrylic copolymer in solvents.

Consumption: approximately 80-200 g/m^2, depending on absorption.

2. Structures created with disposable formwork

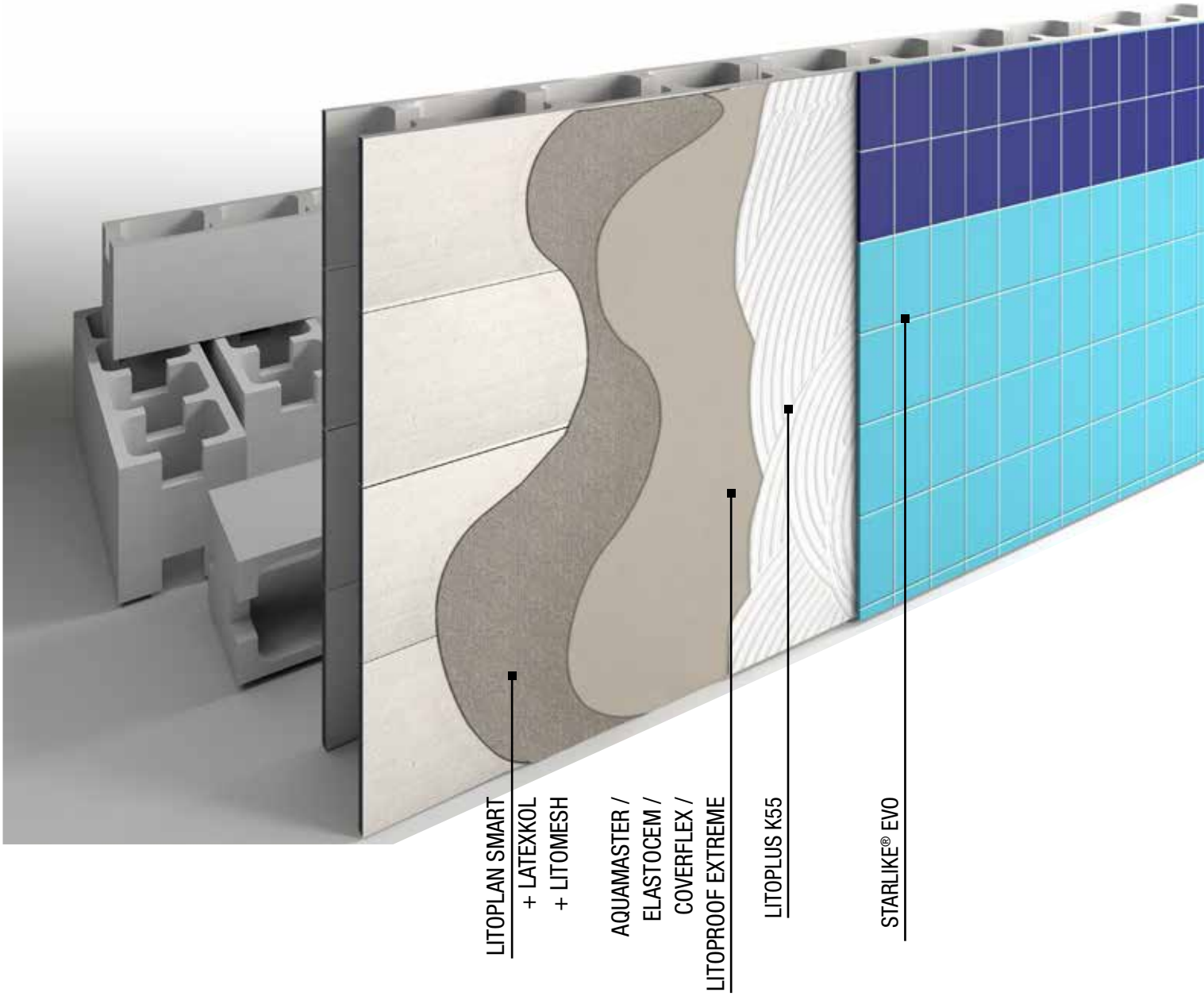
Recent years have seen the emergence of new technologies that combine the solidity of concrete with faster application: concrete pools with disposable formwork.
The formwork can be created using a variety of materials (concrete, polystyrene or polypropylene) and this forms part of the pool structure itself.
Disposable formwork pools consist of a concrete wall contained within a structure created from concrete, polystyrene or polypropylene formwork.

Levelling the surfaces

To level the walls, Litokol provides Litoplan Smart controlled-shrinkage, cementitious mortar to create a reinforced levelling layer with anti-alkaline, fibreglass mesh, in thicknesses ranging from 2 to 25 mm.
Litoplan Smart mortar must be mixed with Latexkol latex in aqueous dispersion in total water replacement in order to increase the deformability of the levelling compound itself.

Once hardened, the surface may be waterproofed using waterproofing mortars Aquamaster, Coverflex/Elastocem or Litoproof Extreme, utilising the methods described in the WATERPROOFING INSIDE THE TANK chapter.

ZavattiShop Structures



LITOPLAN SMART

Cementitious thixotropic levelling layer featuring rapid hardening and drying for vertical or horizontal applications, indoors and outdoors, in a range of thicknesses from 1 to 25 mm. Product with ultra-low volatile organic compounds (VOC) emissions.

Consumption: 1.6 kg/m² per every mm of thickness

LATEXKOL

Elasticising synthetic latex for cementitious adhesives.

LITOMESH

Anti-alkaline, fibreglass reinforcement mesh.

Mesh dimensions: 4x5 mm.
Roll dimensions: Length = 50 m – Height = 1 m

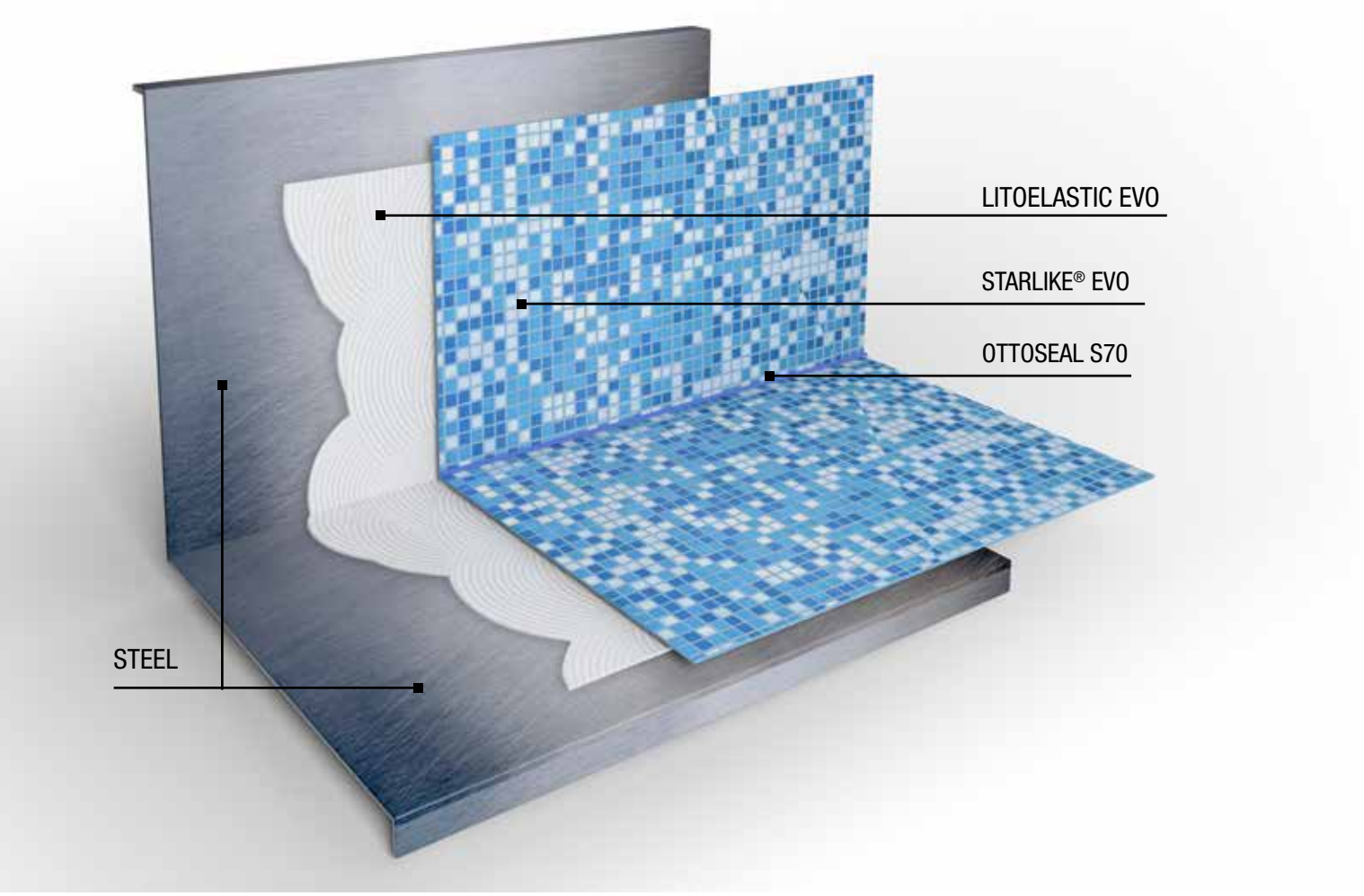
3. Metal and fibreglass structures

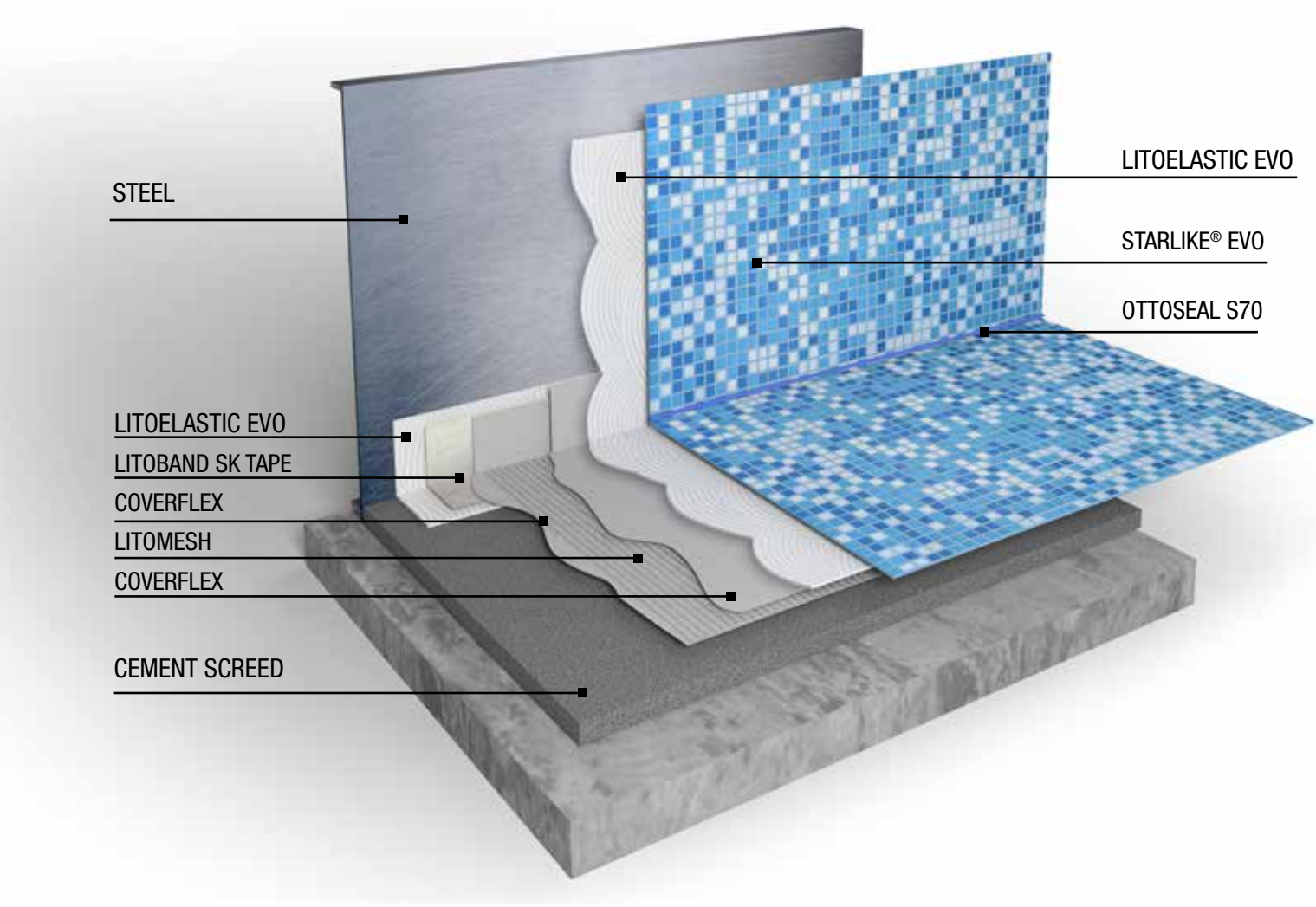
Another type of swimming pool construction, as an alternative to reinforced concrete, is the use of steel structures.
The steel used must be corrosion-resistant and, therefore, classified as AISI 316 or AISI 316L (Low carbon) stainless steel.
Stainless steel has a long tradition in the construction industry, it has low maintenance costs, a long service life, is versatile when undergoing processing and is resistant at low temperatures.

Metal structures

Ceramic and porcelain tiles or mosaics can be installed directly to this type of pool using Litoelastic EVO flexible, reactive, 2-component adhesive.
Its elevated adhesion on all substrate types and extreme deformability of the adhesive once hardened, give Litoelastic EVO the property of absorbing any structural dislocations or thermal expansion of the substrate, ensuring a firm, long-lasting bond.
It is possible to use the same product applied using a smooth steel trowel to perform levelling/waterproofing in thicknesses of 2-3mm.

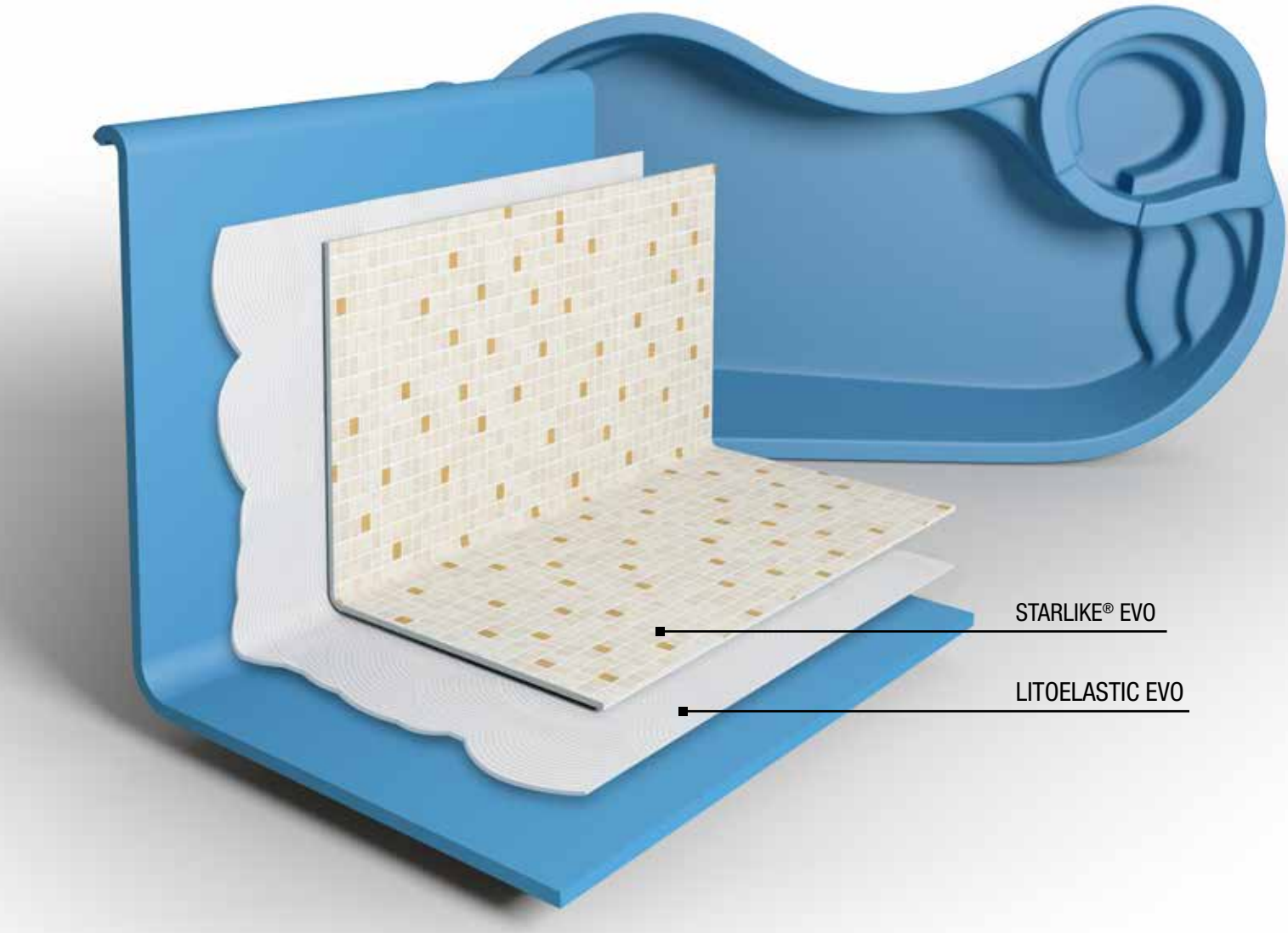
If the foundation is a cementitious screed, it must be waterproofed before laying.
Litoband SK Tape must first be bonded to the trims between the cementitious foundation and the steel walls using Litoelastic EVO.
The Litoband SK Tape junction between the horizontal and vertical corners of the structure is fortified by the insertion of special Litoband SK IC (internal corners) and EC (external corners) trims.
Once the waterproofing stage for all trims is complete, waterproof the cementitious surface with the application of Elastocem/Coverflex and insertion of Litomesh fibreglass mesh between the 2 layers or Aquamaster in the manner described in previous sections, without using the mesh, interrupting at the occurrence of any tapes and ensuring complete coverage. Bonding must then be carried out using Litoelastic EVO flexible, reactive, 2-component, adhesive.


LITOELASTIC EVO
STARLIKE® EVO
OTTOSEAL S70
STEEL


STEEL
LITOELASTIC EVO
STARLIKE® EVO
OTTOSEAL S70
LITOELASTIC EVO
LITOBAND SK TAPE
COVERFLEX
LITOMESH
COVERFLEX
CEMENT SCREED

Fibreglass structures

Fibreglass pools are constructed using layers of polyester resin and fibreglass applied to special moulds.
The tank is, therefore, constructed as a single unit that can be customised using a variety of accessories and finishes.
As fibreglass pools are not self-supporting, they are normally constructed in-ground and not left above ground.
As they are sensitive to settling and subsidence, it is always preferable to construct a reinforced concrete slab to which the bottom of the tank is anchored in order to reduce this particular risk.
The interior cladding of fibreglass pools is created using gel-coat (a polyester, resin-based product) that is smooth and pleasant to the touch.
Even in this case, tiles or mosaic can be laid directly with Litoelastic EVO following sanding and subsequent removal of dust.


STARLIKE® EVO
LITOELASTIC EVO

Litoelastic EVO

Advantages

✓This particularly versatile product is suitable for installation in indoor and outdoor swimming pools of all types of ceramic and porcelain tiles including thin slabs or natural stone with reinforced backing, ceramic and glass mosaics, including those that are transparent, and natural stone.

✓Exceptional adhesion on waterproofing membranes such as Aquamaster, Elastocem, Coverflex and Litoproof Extreme, and even on non-traditional substrates such as metal sheets, stainless steel, fibreglass or waterproofing created using reactive, two-component epoxy-polyurethane membranes.

✓Reactive adhesive formulated using particular raw materials that give the product exceptional ease of application, which is unique in its kind.

✓Product with elevated deformability and excellent water-repellent properties.

✓Product is not classified in the hazardous item category and is, therefore, exempt from restrictions for road, sea, air or rail transportation (ADR-ADN-IMDG-IATA classes).

✓Suitable for laying artistic mosaics in complex patterns on fibreglass mesh.

✓Product with ultra-low volatile organic compounds (VOC) emission rate.
Conforms to EC1^{PLUS} class according to EMICODE protocol and A+ class (Émission dans l'air intérieur – French Regulations)

✓Product classified R2T in compliance with European standard EN 12004

In the case of pools or whirlpools created on boats, use is recommended of low flame-spread Litoelastic EVO FR in compliance with Directive 2014/90/EU (MED) in accordance with the IMO 2010 FTP Code, for use in marine environments.

LITOELASTIC EVO

High-performance, white, two-component reactive adhesive for laying floors and walls indoors and outdoors of any type of ceramic and porcelain tiles, including reinforced thin slabs, mosaics, natural and reconstituted stone, even on non-traditional substrates, such as wood, metal or fibreglass. Suitable for installations over existing tiles, on heated floors and in pools. Product with ultra-low volatile organic compounds (VOC) emissions.

0474

LITOELASTIC EVO FR

High-performance two-component reactive adhesive for indoor and outdoor installations of all types of ceramic and porcelain tiles, mosaic, natural and recomposed stone, on walls and floors, including non-traditional substrates such as wood, metal and fibreglass. Suitable for installations over existing tiles, on heated floors and in pools. Low flame-spread product compliant with Directive 2014/90/EU (MED) pursuant to IMO 2010 FTP Code for use on ships. Product with ultra-low volatile organic compounds (VOC) emissions.

Anti-slip treatment of external walkways or steps

An error in the wrong design or choice of material for walkways or steps may pose a risk in terms of slipperiness when the surface is wet.
To overcome these issues, Litokol provides Litogrip Floor to create a long-lasting, anti-slip effect by increasing the surface friction of the selected porcelain tile surface.

LITOGRIP FLOOR
Anti-slip treatment for tiles and mosaics made of porcelain stoneware, granite, quartz.

Consumption: 15-20 m^2 / L

Pool maintenance

When the tank is not in use, lower the water level of 10-15 cm, emptying the pipes and protecting the pool with plastic sheets placed on the surface of the water.
Do not empty the tank completely so as not to subject the structure to freezing and, in the case of in-ground pools, to prevent counter-push of the adjacent ground which may be transferred to the inner lining and damage it, causing it to crack, split, buckle or detach.

Note

The information provided in this document has been drafted to the best of our knowledge and experience, and to the best of our technical knowledge on laying ceramic and porcelain tiles.

Given the considerable number of cases and variety of unforeseen events that may arise, the information provided should, therefore, be considered for indicative purposes only. Before initiating any installation, it is therefore essential that the designer in responsible for tile layout and the project manager identify the best design choices.

CTLPSC02
3-02.2021

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