SICIS PRODUCTS INSTALLATION MANUAL

This manual aims to provide useful information for the correct installation of glass mosaics (Natural, Colibrì, Neo Colibrì, Glimmer, Murano, Firefly, WaterGlass, Iridium, Structura), marble mosaics, marble, stone or onyx slabs of SiciStone SICIS programme.

PRELIMINARY CHECK OF THE SUBSTRATE

Prior to laying, perform the checks of the following features that the supports must have.

Flatness

A fundamental requirement of the supports is the flatness. In the case of marble slabs with a minimum thickness of 10 mm, the measured tolerance with 2 meter straight edge is ± 3 mm, whereas for vitreous mosaic with a thickness of 4 mm, it must not exceed ± 1.5 mm. Small defects can be corrected using the same adhesive as a levelling layer, while more obvious defects (> 5 mm) should be recovered via the use of suitable cement-based levelling layers:

- LITOLIV EXTRA 15 (self-levelling cement with rapid drying and setting free of shrinkage for thicknesses from 1 to 15 mm, with low emission of volatile organic compounds – EMICODE EC1, for indoor use).
- LITOLIV S40 ECO (self-levelling cement-based, fast-hardening and drying for the levelling of substrates from 3 to 40 mm of thickness, fibre-reinforced).
- LITOPLAN RAPID (thixotropic cement levelling layer featuring ultra-fast hardening and drying for vertical and horizontal applications thicknesses ranging from 1 to 25 mm.

Aging and maximum moisture allowed

Whatever the nature of the supports, their aging cycle must be complete so that they are dimensionally stable and not subject to shrinkage after the laying of tiles or slabs. In the case of traditional cement-based screeds, aging can vary according to the season, ranging from 7 to 10 days per centimetre of thickness. Instead of using common Portland cement, shorter waiting times can be reached by using normal-setting and quick drying hydraulic binders such as LITOCEM which allows the laying of glass mosaics after 24 hours and of natural stone slabs after 3 days. For these types of supports, the maximum moisture content allowed should not exceed 3%. Aging lasts at least 6 months in the case of concrete surfaces. Gypsum-based substrates, such as anhydrite-based screeds or gypsum plasters, must reach a maximum residual moisture of 0.5%. For cement-based pre-mixed plasters, it is recommended to follow the supplier's recommendations concerning aging and the mechanical strength.

Cleaning

Supports must always be clean, free of loose fragments, paint, wax, grease, oil or anything else that can affect the correct adhesion of the product. Concrete substrates must be cleared of release agent residues. A previous cleaning with hot water pressure washer or by sandblasting is always recommended. Existing ceramic surfaces must be thoroughly degreased with alkaline detergents or with a caustic soda water solution.

Mechanical strength

In flooring, the substrates must have adequate mechanical compressive strength in relation to the intended destination area. For example, a cement-based screed in an indoor residential building must have a minimum compressive strength of at least 20 N/mm^2, while a cement-based plaster or gypsum-based plaster applied on an indoor wall should have an adhesive strength of

at least 0.5 N/mm^2. In the case of laying on an outdoor facade plaster, ensure that the plaster is suitable for the tiles or natural stone slabs (characterised by a high weight) and therefore has an adhesion value to support at least 1 N/mm^2. In order to ensure a good degree of adhesion, the supports must be strong enough and have a non-powdery surface. To improve this feature, appropriate consolidating primers in aqueous solution such as PRIMER C can be used, which is compatible with any cement-based adhesive.

Preparation of the substrate for laying mosaics

In the case of laying of transparent glass mosaics, a prior levelling of the support will be required by using a white cement-based adhesive such as Litoplus K55 in order to homogenise the colour and without altering the colour of the mosaic. In the case of substrates that are particularly smooth, poorly absorbent or subject to vibrations and dilations, we recommend mixing Litoplus K55 with Latexkol diluted 1:1 with water so as to further improve adhesion. The subsequent laying of mosaics can be performed after full hardening of the levelling layer in about 24 hours depending on the ambient temperature. Before proceeding with the laying, we recommend that you trace lines on the surface to be covered to help the correct alignment of the sheets. At this stage, squares and level detectors and laser instruments can be useful. After distribution on the floor, measure the total of 3 sheets, set in such a way that the distance between the sheets is the same as that between tiles. Transfer this measurement to the surface to be covered, both horizontally and vertically, in order to trace a grid with the straight edge and even a level. The wall will be divided into several squares, each of which corresponds to nine sheets of mosaic. If the mosaic represents a drawing or has to follow a particular composition, follow the laying instructions provided by the manufacturer. Even in case of mosaics with tiles that do not have a square shape and therefore irregular edges on the sheet, it is important to make sure that the distance between one sheet and the other is equal to that between the individual tiles, so that all the joints are identical.

Preparation of the support for laying the marble slabs

In this paragraph, the solutions to adopt for the creation of cement supports to cover with the laying of stone materials are indicated so as to avoid the formation of stains and the appearance of efflorescence. Despite the possibility of stains on almost all stone materials, this possibility is greater in the case of white carrara-type marble, thassos, onyx, etc. This problem is due to the presence of iron minerals in the stone material which, transferred toward the surface by water contained in the adhesive or in the substrate and subsequently reacting with oxygen and light, cause the appearance of stains that undermine the superficial aesthetics. Possible solutions to prevent these phenomena are:

- In the case of laying on floors, provide for a vapour barrier before creating the screed in order to prevent the rise of water by capillarity.
- Observe the aging time of the plaster or the screed or check that the maximum content of moisture (measured with carbide hygrometer) does not exceed 3% in the case of a screed or cement plaster and 0.5% for anhydrite screeds or plaster-based gypsum. Binding materials for the quick-drying of screeds can be used which allow laying already after 3 days of aging such as the binding material produced by Litokol S.p.A. called LITOCEM.
- In the case of regularisation of the support, use rapid levelling or self-levelling mortars such as LITOLIV EXTRA 15, LITOLIV S40 ECO or LITORAPID.
- For the laying of marble slabs subject to possible stains, use rapid drying or white reactive cement-based adhesives such as LITOSTONE K99 and LITOELASTIC produced by Litokol S.p.A.

CHOOSING THE ADHESIVE

In the following synoptic charts, it is possible to identify suitable adhesives for the laying of various types of mosaics and marble slabs based on the support, the size of the slabs and the intended use. Generally, white adhesives, possibly with zero vertical slip, are preferred in the case of laying on walls. The white colour of the adhesive is absolutely necessary for transparent glass mosaics and white marble or onyx in order to avoid unwanted shades of colour on the finished surface. A special note must be given to the epoxy mortar STARLIKE®, which can be used both as an adhesive and as grouting mortar for the joints on vitreous mosaics. There are many benefits associated with this product but especially in the case of very thin glass mosaics; the possibility of using the same product both as an adhesive and grout allows using any colour without the risk of interferences between the grouting colour and the adhesive used for the laying.

CHART FOR THE CHOICE OF SICIS ADHESIVES FOR MOSAICS

	SUBSTRATES	SICIS COLLECTION				
		Glimmer, Iridium, WG, Murano, Natural, Pixel, Neoglass, Firefly	COLIBRI' NEO COLIBRI'	ACCIAIO (Steel) ARTISTI CI (Artistic)	BASIC	STRUCTURA
INDOOR FLOORS	SEPARATE CEMENT-BASED OR SEASONED FLOATING SCREEDS	1 2 3 4	3 4	3	1 2 3 4	Laying not recommended
	DRY, SANDED DOWN ANHYDRITE SCREEDS TREATED WITH PRIMER C	1 2 3 4	3 4	3	1 2 3 4	
	CEMENT-BASED HEATED SCREEDS HEATING AFTER THE PRE-HEATING CYCLE	1 2 3	3 4	3	1 2 3	
	SMOOTHED CONCRETE SLABS	1 2 3 4	3 4	3	1 2 3 4	
	WOODEN OR METAL PANELS	3	3	3	3	
	SURFACES WATERPROOFED WITH HIDROFLEX-COVERFLEX-ELASTOCEM	2 3 4	3 4	3	2 3 4	
	EXISTING OLD CERAMIC OR STONE TILING	2 3 4	3 4	3	2 3 4	
INDOOR WALLS	CEMENT-BASED PLASTERS	1 2 3 4	3 4	3	1 2 3 4	4
	CONCRETE	1 2 3 4	3 4	3	1 2 3 4	4
	GYPSUM-BASED PLASTERS TREATED WITH PRIMER C	1 2 3 4	3 4	3	1 2 3 4	4
	GYPSUM-BOARDS	1 2 3 4	3 4	3	1 2 3 4	4
	WOODEN OR METAL PANELS	3	3	3	3	3
	PLEXIGLASS, POLYCARBONATE, GLASS, CRYSTAL PANELS	5 Only with transparent mosaics on paper	Laying not recommended			Laying not recommended
	PREFORMED PANELS IN POLYSTYRENE	2 3 4	3 4	3	2 3 4	4
	SURFACES WATERPROOFED WITH HIDROFLEX-COVERFLEX-ELASTOCEM	2 3 4	3 4	3	2 3 4	4
	EXISTING OLD CERAMIC OR STONE TILING	2 3 4	3 4	3	2 3 4	4
OUTDOOR FLOORS	SEPARATE CEMENT-BASED OR SEASONED FLOATING SCREEDS	Laying not recommended			2 3	Laying not recommended
	SEASONED CONCRETE STRUCTURES	Laying not recommended			2 3	
	EXISTING OLD CERAMIC OR STONE TILING	Laying not recommended			3	
	SURFACES WATERPROOFED WITH COVERFLEX-ELASTOCEM	Laying not recommended			2 3	
OUTDOOR WALLS	CEMENT-BASED PLASTER ON SEASONED WALLING	2 3	3	3	2 3	Laying not recommended
	CAST OR PREFORMED SEASONED CONCRETE	2 3	3	3	2 3	
	EXISTING OLD CERAMIC OR STONE TILING	Laying not recommended				
WET AREAS	REINFORCED CONCRETE SWIMMING POOLS WATERPROOFED WITH ELASTOCEM OR COVERFLEX*	2 3 4	3 4	3	2 3 4	Laying not recommended
	HAMMAM WITH SUPPORT MADE OF WATERPROOF EXTRUDED POLYSTYRENE PANELS	2 3 4	3 4	3	2 3 4	

* In the case of installing mosaics on mesh in swimming pools, the use of Litoelastic or Starlike® will be required.

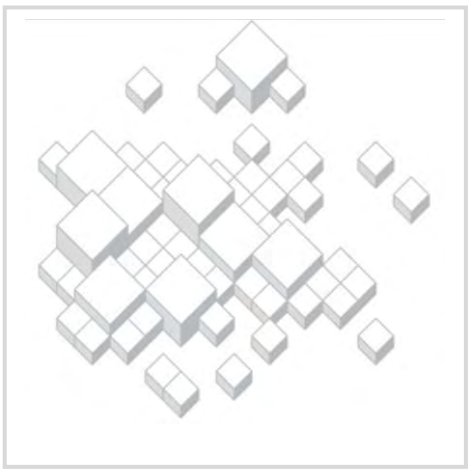
Key

1	Litoplus K55 + 32% Water	C2TE	completely white high-performance (C2) cement-based adhesive with no vertical slip (T) and extended setting time (E)
2	Litoplus K55 + 32% Latexkol diluted 1:1 with water	C2TE-S1	completely white high-performance (C2) cement-based adhesive with no vertical slip (T) and deformable (S1) extended setting time (E)
3	Litoelastic	R2T	completely white high-performance adhesive (R2) with no vertical slip (T)
4	Starlike®	R2T	completely white high-performance adhesive (R2) with no vertical slip (T)
5	Dowcorning 794F- type neutral transparent silicone		transparent single-component sealer with neutral curing

Instructions for the laying of the SICIS COLIBRI' AND NEO COLIBRI' MOSAIC COLLECTION
All the mosaics in this collection must be laid and grouted exclusively with two component epoxy or epoxy-polyurethane products regardless of the type of support and intended use.
For the installation in wet areas, please consult the SICIS Technical Office preventively.

Notes and instructions for the installation of Blends Collection (and custom blends in general)
In order to give more variety and richness to our blends or pixall decoration proposals, we have also combined, besides Gold and Platinum, colors from the various other collections, regardless the differences in thickness (3 – 4 mm) among the materials.
For this reason these products are delivered mounted on paper to be removed after installation.
Paper sheet supports allow to compensate the thickness difference by using a slightly higher amount of adhesive.
In case the blend is composed by colors in "tide" finish (like golden tide, Platinum Tide and the Colibrì collection colors in tide version) the difference in thickness must be accepted since part of the characteristics of these products.
It is anyway clear that floor installation, of this type of material, is not suggested since any small imperfection in planarity does not allow a perfect flat installation of the overall surface.
This same rule applies to blends and pixelated customized decorations or designs proposed by client.

Instructions for laying the STRUCTURA collection
For laying it is recommended to use the Starlike® epoxy mortar in harmony with the chosen mosaic so that any adhesive escaping from the gaps does not interfere with the colour of the mosaic.
Recommended spatula: 3.5 x 3.5 mm.
In certain special cases it is necessary to use the bi-component Litoelastic adhesive (see adhesive choice chart).
In view of the three-dimensional structure of the collection it is recommended to carry out a thorough analysis of the following points in the design stage.
1. **Puttying**: not recommended
2. **Laying**: it must be done in order to assure adhesion of all elements of the mosaic including those with lower thickness. Sicis and Litokol shall not be liable for any damage arising from incorrect laying.



Structura collection

CHART FOR THE CHOICE OF ADHESIVES FOR SICIS MARBLE MOSAICS

	SUBSTRATES	TYPES OF INSTALLATION: Fibreglass mat on the back and transparent film on the front	TYPES OF INSTALLATION: Fiberglass or paper mesh on the back	
INDOOR FLOORS	SEPARATE CEMENT-BASED OR SEASONED FLOATING SCREEDS	4	1 2 3 4	
	DRY, SANDED DOWN ANHYDRITE SCREEDS TREATED WITH PRIMER C	4	1 2 3 4	
	CEMENT-BASED HEATED SCREEDS HEATING AFTER THE PRE-HEATING CYCLE	4	1 2 3 4	
	SMOOTHED CONCRETE SLABS	4	1 2 3 4	
	WOODEN OR METAL PANELS	4	4	
	SURFACES WATERPROOFED WITH HIDROFLEX-COVERFLEX-ELASTOCEM	4	1 2 3 4	
	EXISTING OLD CERAMIC OR STONE TILING	4	1 2 3 4	
INDOOR WALLS	CEMENT-BASED PLASTERS	4	1 2 3 4	
	CONCRETE	4	1 2 3 4	
	GYPSUM-BASED PLASTERS TREATED WITH PRIMER C	4	1 2 3 4	
	GYPSUM-BOARDS	4	1 2 3 4	
	WOODEN OR METAL PANELS	4	4	
	PREFORMED PANELS IN POLYSTYRENE	4	1 2 3 4	
	SURFACES WATERPROOFED WITH HIDROFLEX-COVERFLEX-ELASTOCEM	4	1 2 3 4	
	EXISTING OLD CERAMIC OR STONE TILING	4	1 2 3 4	
OUTDOOR FLOORS	SEPARATE CEMENT-BASED OR SEASONED FLOATING SCREEDS	4	1 2 3 4	SEE WARNINGS
	SEASONED CONCRETE STRUCTURES	4	1 2 3 4	
	EXISTING OLD CERAMIC OR STONE TILING	4	2 3 4	
	SURFACES WATERPROOFED WITH COVERFLEX-ELASTOCEM	4	1 2 3 4	
OUTDOOR WALLS	CEMENT-BASED PLASTER ON SEASONED WALLING	4	1 2 3 4	
	CAST OR PREFORMED SEASONED CONCRETE	4	2 3 4	
	EXISTING OLD CERAMIC OR STONE TILING	Laying not recommended		
WET AREAS	REINFORCED CONCRETE SWIMMING POOLS WATERPROOFED WITH ELASTOCEM OR COVERFLEX*	4	4	
	HAMMAM WITH SUPPORT MADE OF WATERPROOF EXTRUDED POLYSTYRENE PANELS	4	4	

* In the case of laying marble mosaic installed on mesh in swimming pools, the use of Litoelastic is required.
* For white marble/onyx or other materials subject to staining, use Litostone K99 or Litoelastic.
* When ordering, specify if the intended use of the marble mosaic is for moist environments (swimming pools, bathtubs, Turkish baths, etc).

Key

1	Litoplus K55	C2TE	completely white high-performance (C2) cement-based adhesive with no vertical slip (T) and extended setting time (E)
2	Superflex K77 white	C2TE-S1	completely white high-performance (C2) cement-based adhesive with no vertical slip (T) and deformable (S1) extended setting time (E)
3	LITOSTONE K99	C2FE	completely white high-performance rapid (F) cement-based adhesive (C2) and extended setting time (E)
4	Litoelastic	R2T	completely white high-performance adhesive (R2) with no vertical slip (T)

CHART FOR THE CHOICE OF ADHESIVES FOR SICIS MARBLE SLABS

	SUBSTRATES	COSMATI – SICISTONE – THE MARBLE			
		NON-STAININGS MARBLES		WHITE/ONYX MARBLES OR OTHER MATERIALS SUBJECT TO STAINING	
		LONG SIDE ≤ 60 cm	LONG SIDE > 60 cm	LONG SIDE ≤ 60 cm	LONG SIDE > 60 cm
INDOOR FLOORS	SEPARATE CEMENT-BASED OR SEASONED FLOATING SCREEDS	1 2 3 4	2 3 4 double coating	3 4 double coating	4 double coating
	DRY, SANDED DOWN ANHYDRITE SCREEDS TREATED WITH PRIMER C	1 2 3 4	2 3 4 double coating	3 4 double coating	4 double coating
	CEMENT-BASED HEATED SCREEDS HEATING AFTER THE PRE-HEATING CYCLE	1 2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
	SMOOTHED CONCRETE SLABS	2 3 4	2 3 4 double coating	3 4 double coating	4 double coating
	WOODEN OR METAL PANELS	4 double coating	4 double coating	4 double coating	4 double coating
	SURFACES WATERPROOFED WITH HIDROFLEX-COVERFLEX-ELASTOCEM	1 2 3 4	2 3 4 double coating	3 4 double coating	4 double coating
	EXISTING OLD CERAMIC OR STONE TILING	2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
INDOOR WALLS	CEMENT-BASED PLASTERS	1 2 3 4	2 3 4 double coating	3 4 double coating	4 double coating
	CONCRETE	2 3 4	2 3 4 double coating	3 4 double coating	4 double coating
	GYPSUM-BASED PLASTERS TREATED WITH PRIMER C	1 2 3 4	2 3 4 double coating	3 4 double coating	4 double coating
	GYPSUM-BOARDS	1 2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
	WOODEN OR METAL PANELS	4 double coating	4 double coating	4 double coating	4 double coating
	PREFORMED PANELS IN POLYSTYRENE	2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
	SURFACES WATERPROOFED WITH HIDROFLEX-COVERFLEX-ELASTOCEM	1 2 3 4	2 3 4 double coating	3 4 double coating	4 double coating
	EXISTING OLD CERAMIC OR STONE TILING	2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
OUTDOOR FLOORS	SEPARATE CEMENT-BASED OR SEASONED FLOATING SCREEDS	1 2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
	SEASONED CONCRETE STRUCTURES	2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
	EXISTING OLD CERAMIC OR STONE TILING	2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
	SURFACES WATERPROOFED WITH COVERFLEX-ELASTOCEM	2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
OUTDOOR WALLS	CEMENT-BASED PLASTER ON SEASONED WALLING	2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
	CAST OR PREFORMED SEASONED CONCRETE	2 3 4 double coating	2 3 4 double coating	3 4 double coating	4 double coating
	EXISTING OLD CERAMIC OR STONE TILING	Laying not recommended			
WET AREAS	REINFORCED CONCRETE SWIMMING POOLS WATERPROOFED WITH ELASTOCEM OR COVERFLEX	4 double coating	4 double coating	4 double coating	4 double coating
	HAMMAM WITH SUPPORT MADE OF WATERPROOF PREFORMED POLYSTYRENE PANELS	4 double coating	4 double coating	4 double coating	4 double coating

SEE WARNINGS

Key

1	Litoflex K80 white	C2E	high-performance cement-based adhesive (C2) and extended setting time (E)
2	Superflex K77 white	C2TE-S1	completely white high-performance (C2) cement-based adhesive with no vertical slip (T) and deformable (S1) extended setting time (E)
3	LITOSTONE K99	C2FE	completely white high-performance rapid (F) cement-based adhesive (C2) and extended setting time (E)
4	Litoelastic	R2T	completely white high-performance adhesive (R2) with no vertical slip (T)

Instructions for the laying of Sicistone with Icemir inserts

Use only epoxy-polyurethane adhesives (Litoelastic).

Warning for the laying of green marbles

In the case of the laying of marble slabs, in addition to the factors described above regarding staining, you must pay particular attention to their dimensional stability. Some types of marble such as green marble (Antique Green, Bamboo Green, Olive, Green, Jade Green, Lapland Green, Moon Green, Namibia Green), may suffer heavy warping due to the absorption of water contained in the adhesive mix. For these types of marble, the choice of the adhesive must necessarily fall on two-component reactive adhesives such as LITOELASTIC when is free of water content, preventing the warping of the slab. Being such dimensional deformations also due to the geometry and the thickness of the slabs, it is difficult to consider all possible cases. In doubtful cases, therefore, it is recommended to consult our SICIS technical office beforehand for the definition of the adhesives and laying techniques most appropriate.

Warning for laying of marble slabs on

The laying of large and thick slabs on façades represents a high criticality type of laying. The different nature of the substrates (plaster or concrete), the expected thermal excursions that are more or less affective, the maximum height of the covering, the presence of seismic risk and the dimensional characteristics of the slabs make appropriate, in some cases, to carry out a mechanical fixing of the slabs coupled to a binding with adhesives. For these reasons, we recommend to consult our SICIS technical office beforehand if the projects involve the laying on façades.

Instructions for the laying of marble slabs and mosaics on outdoor floors

Even in this case, depending on the variety of marbles proposed by SICIS, combined with the dimensional variability, it is not possible to provide a precise indication for all cases. Too many variables are involved relating to an outdoor flooring: vastness of the surface to be covered, exposure to sunlight and weathering, thermal excursions expected depending on the geographic area, etc. For these reasons, the correct design of an outdoor natural stone flooring, including the disposal of any fractionation and expansion joints, must be performed with extreme caution with all elements previously described. It is therefore recommended to consult the SICIS technical SICIS office for further details.

Instructions for the laying of marble slabs and mosaics in swimming pools

For the installation of marble slabs and mosaics, you need to identify beforehand the specifications of each individual project. In particular, the type of pool structure (on-site concrete casting, prefabricated panels, steel pools, fibreglass pools, etc.), the location (underground, suspended pools, etc.), the type of disinfection system and the size are all necessary information to ensure a correct choice of the type of product and marble laying. The SICIS technical office is at your disposal to provide the best solutions.

LAYING OPERATIONS

Once you have chosen the most suitable adhesive and prepared the mix according to the directions on the packaging and on the technical sheets, it is advisable to apply the adhesive mortar on the smooth edge of the spatula in order to even out the colour of the same support and soon after applying a further quantity of the product using the 3.5 mm notched trowel in the case of vitreous mosaic or with bigger notches in the case of the marble slabs.

In these cases, the teeth of the spatula are proportional to the size of the sheets and the must guarantee a covering of the adhesive of at least 80% in the case of indoor environments and 100% in outdoor environments on the back of the slab. In the case of large sizes, the double coating system is recommended. It is preferable not to cover areas that are too wide with the adhesive (about 1 m^2) in order to prevent the formation of a film on the surface. In the

case of transparent mosaics, traces of the adhesive must be eliminated (otherwise they will be visible due to the transparency of the mosaic) by using the smooth edge of the spatula being careful not to remove the adhesive. Even in the case of white marble slabs and onyx, it is important to ensure a "full bed" laying so as to avoid unpleasant imperfections due to the presence of gaps between the slab and the support. Apply the mosaic sheets by tapping the tiles with a rubber spatula to ensure a perfect adhesion, preventing air bubbles and preventing the adhesive from leaking into the joints between the tiles and leaving enough thickness for the subsequent grouting. If the adhesive is in excess and leaks out from the joints, it will be necessary to remove it before setting using a brush or brush with hard bristles.

If a paper-mounted mosaic has been applied, the paper must be removed after approximately 24 hours or anyway after the adhesive is completely set. The paper, moistened with a sponge, can be easily removed after a few minutes by slowly pulling it diagonally and close to the wall. At this stage, we recommend to clean the mosaic surface completely by washing away with clean water any residue of the paper adhesive that may interfere with the subsequent grouting.

Warning

Before grouting with Litochrom Starlike, make sure that the joints are perfectly dry.

Laying of glass mosaics on Plexiglas, polycarbonate, glass and crystal

This laying technique can be carried out only in the case of transparent mosaic mounted on paper sheets. Taking advantage of the transparency of the support, you can obtain decorative effects and exclusive back-lit walls.

Remove any transparent protective film from the support. Before the application, all supports must be thoroughly cleaned and degreased with specific detergents using a cloth that does not release fibres on the surface. Consider that any remaining dirt or material on the support will be visible when the laying work is completed due to the transparency of the mosaic. Apply a transparent single-component sealant by extruding it from the cartridge with a special gun cartridge directly on the support, making spots of sealant spaced about 8-10 cm among them both horizontally and vertically on an area not exceeding 60 x 90 cm. Spread the product with 2 mm triangular toothed notched trowel (VVVV) and proceed with the application as reported earlier. For this process, it is essential to eliminate all air bubbles by thoroughly pressing the mosaic sheets. The removal of the paper sheet can be carried out after approximately 24 hours from the application, after full hardening of the single-component adhesive.

INSTALLATION IN SWIMMING POOLS, HAMMAM AND SPA TUBS

We suggest to take an in-depth look at these types of works due to their typical critical issues.

Swimming pools

The application in swimming pools with reinforced concrete structures includes a number of preliminary checks and inspections of the same structure in order to ensure adequate durability.

1. The underground concrete structures must be waterproofed on the outer walls before covering the excavation in order to prevent negative water pressure that could have an impact on the inner surface.
2. The concrete structure requires an aging period of about 6 months to complete all hygrometric shrinkages and in order to be considered dimensionally stable.
3. It is necessary to perform a static test on the raw structure by filling it with water in order to accelerate the processes of structural adjustment and check its water-resistance against any losses that may be solved properly.
4. The walls and floors inside the pool must be rectified with suitable polymer-modified cement mortars in order to regularise the laying surface avoiding the use of excessive amounts of adhesive that, in the case of thin glass mosaics, would make the application difficult if not impossible.

5. In order to ensure a total sealing of the pool, it will be necessary to apply suitable two-component cement-based waterproofing mortars before installation such as Elastocem or Coverflex. The waterproof mortar is applied in two coats, interposing a 4 x 4 mm reinforcement fibre-glass net among the first and the second coat using appropriate sealants (Litoband) at the corners, joints, drains and lights.
6. Use recommended adhesives listed in the charts for installation using the techniques described in the previous paragraphs.
7. As for grouting, it is recommended the use of a two-component epoxy mortar such as Starlike® which ensures, thanks to its lack of absorption properties, high mechanical and chemical resistance, not to mention the long lasting durability if compared to any cement or urethane grout. The use of Starlike® epoxy mortar is mandatory in case of thermal spas or pools containing seawater.

Hammam

Hammam or Turkish bath is a wellness path saturated with humidity and temperatures ranging from low to high from +30° C to +60° C (calidarium). Usually, the structures within these rooms consist of prefabricated panels and shaped elements (sunbeds, benches, recesses, etc.) in extruded polystyrene coupled with a waterproofed surface where we directly place coating materials. In this case grout is exclusively with Starlike® epoxy mortar for excellent durability and but the best qualities of hygiene and maintainability.

GROUTING

Before starting to grout the joints, it is necessary to ensure that the adhesive previously used is completely dry and hardened and that even the joints are perfectly dry. After checking this mechanically remove any adhesive that may have leaked into the joints. SICIS recommends using STARLIKE® epoxy mortar produced by Litokol S.p.A. for the grouting of its mosaics and marble slabs to guarantee the following advantages:

- Homogeneous and brilliant colour
- Wide colour range (103 finishing)
- Water absorption practically does not exist
- Ease of application and cleaning
- High final resistance of the grouting and therefore greater durability

Please observe the directions provided in the product packaging and described below. Make sure the conditions of the work site are suitable for the application.

If the grouting is applied on marble slab floors or tiles, even in large sizes, without pre-treatment, it is necessary to apply Starlike® epoxy mortar over the entire surface of the slabs in order to spread the resin, and avoid chromatic variations. Vice versa, in the case of slabs where surface treatment has been already done, Starlike® epoxy mortar can be applied only along the joints.

In the case of application of mosaics with Gray Bardiglio marble elements, grouting with an epoxy mortar causes a change on the surface (wet effect). Furthermore, Starlike® is particularly versatile and can be used in all applications such as:

- Indoor and outdoor floors and walls
- Bathrooms and showers cubicles
- Swimming pools, thermal baths, hammam and steam baths
- Kitchens
- Furnishing elements like doors, bar counters, etc. also in naval industry

STARLIKE® CRYSTAL

Starlike® Crystal is designed for the grout of transparent and artistic vitreous mosaics. Its special formula based on aggregate made of glass beads allows the product applied in the joints to "absorb" the colour of the transparent glass tiles and then change accordingly to their colour. The best results are obtained laying on transparent supports such as Plexiglas, polycarbonate, glass and crystal, possibly back lit by a light source.

Another potential use of Starlike® Crystal concerns the grouting of artistic mosaics or compositions made of mosaic tiles that, properly mixed and shaped, reproduce unique images rich in nuances and shades. If the grouting of these compositions is done with traditional coloured sealants, the appearance of the image represented is compromised, since the coloured grout creates a discontinuity between the tiles and the mosaic. Using Starlike® Crystal, due to its semi-transparency, the original shades of the composition are maintained, creating "neutral" colourless grout lines without interfering with the whole image. For all applications of thin mosaics with Starlike® Crystal we suggest the use of a 2 mm triangular toothed notched trowel (VVVV) to spread the adhesive; this process will avoid eventual shades made by spare material in excess.

STARLIKE® – APPLICATION PROCEDURES

Application procedures of Starlike®

1 - Pour the catalyst contained in the small bucket onto part A (paste). Be sure to pour the entire content of the catalyst.

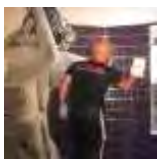
2 – Mix using an electric drill equipped with mixing paddle until a uniform, lump-free mix is obtained. Scrape the sides and the bottom of the container using a spatula to remove eventual residues of product.

3 – The special finishes can be added to the grout Starlike® to get unique and exclusive effects. These additives are available in pre-batched packages for the 5 kg and 2,5 kg Starlike® bucket.

4 – Pour the additive onto the mortar and mix slowly till a uniform mix is obtained.

5 - Apply Starlike® as an adhesive directly on the support with a 3.5 mm notched spatula.

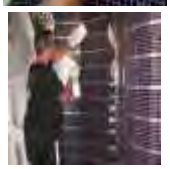
6 – Introduce the mortar into the joints using the suitable green rubber float spreading diagonally across the joints. Remove the excess product with the same float.



7 – The grout must be cleaned and finished while the products is still wet. First sprinkle clean water over the grouted surface. Perform initial cleaning using a moistened white felt making circular movements to perfectly grout the side of the tiles and remove excess grout from the surface.

8 – Now perform a second cleaning with a rigid cellulose sponge to obtain a smooth, closed surface. Change frequently the water, the felt and the sponge when they are impregnated with resin.

9 – Stains or residues of transparent product can be removed from the grouted surface after 24 hours using the specific cleansers LITONET. Spread LITONET on the surface using the white felt. Let in act for 15-30 minutes. Scrub the surface with white felt.



10 - To clean the walls, use LITONET GEL.

11 - Rinse with clean water to remove any remaining detergent.

12 - Dry with a clean and dry cloth and do not wait evaporation of the rinse water.

TABLE OF CONSUMPTIONS

The following tables provide the consumption indications of the products for SICIS mosaics installations.

Adhesive consumption for mosaics

ADHESIVES	2 mm SPATULA	3.5 mm SPATULA	LEVELLING
LITOPLUS K55	1.2 kg/m^2	1.8 kg/m^2	2 kg/m^2 /1 mm
LITOELASTIC	1.1 kg/m^2	1.8 kg/m^2	
STARLIKE®	1.1 kg/m^2	1.6 kg/m^2	
NEUTRAL SILICONE	0.75 m^2 per 310 ml cartridge		

Adhesive consumption for marble slabs

ADHESIVES	8 mm SPATULA	10 mm SPATULA	DOUBLE COATING
LITOFLEX K80	3.5 kg/m^2	4 kg/m^2	5-6 kg/m^2
SUPERFLEX K77	3 kg/m^2	3.5 kg/m^2	5-5.5 kg/m^2
LITOSTONE K99	3.5 kg/m^2	4 kg/m^2	5-6 kg/m^2
LITOELASTIC	3 kg/m^2	3.5 kg/m^2	5-5.5 kg/m^2

Grout consumption for mosaics

MOSAIC SIZES	THICKNESS	STARLIKE®
10X10 mm	4 mm	1.4 kg/m^2
15X15 mm	4 mm	1.2 kg/m^2
	6 mm	1.8 kg/m^2
	8 mm	2.4 kg/m^2
	10 mm	2.7 kg/m^2
CUBES 23X23 mm	4 mm	0.85 kg/m^2
	6 mm	1.3 kg/m^2
	8 mm	1.7 kg/m^2
ROUND BARRELS	4 mm	1.15 kg/m^2
	6 mm	1.7 kg/m^2
	8 mm	2.3 kg/m^2
OVAL DOMES	4 mm	0.95 kg/m^2
	6 mm	1.4 kg/m^2
	8 mm	1.9 kg/m^2
ARTISTIC MOSAICS	4 mm	0.9 kg/m^2
	6 mm	1.35 kg/m^2
	8 mm	1.8 kg/m^2
	10 mm	2.25 kg/m^2

Adhesive consumption for marble slabs

Due to the wide range of sizes proposed by SICIS, the consumption of Starlike® epoxy mortar used for grouting can be calculated using the following formula:

$$\frac{(A+B)}{(AXB)} \times C \times D \times 1.55 = kg/m^2$$

A = slab length (in mm)

B = slab width (in mm)

C = slab thickness (in mm)

D = joint width (in mm)

1.55 = specific weight of Starlike®

Once you have determined the consumption of products, it is recommended to increase the quantity of about 200 g/m ^{2} considering eventual waste during the application process.

SICIS
THE ART MOSAIC FACTORY

SICIS ITALY
Via Canala, 85
48100 Ravenna
Tel +39 0544 46971
Fax +39 0544 469811
www.sicis.it

Document review No. 3 – February 2014

THE **IRIDIUM** MOSAIC COLLECTION

SCHEMA DI POSA · LAYING SCHEME · SCHEMA DE POSE · INSTRUCCIONES DE COLOCACIÓN · VERLEGEANLEITUNG · ИНСТРУКЦИЯ ПО УКЛАДКЕ

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SICIS


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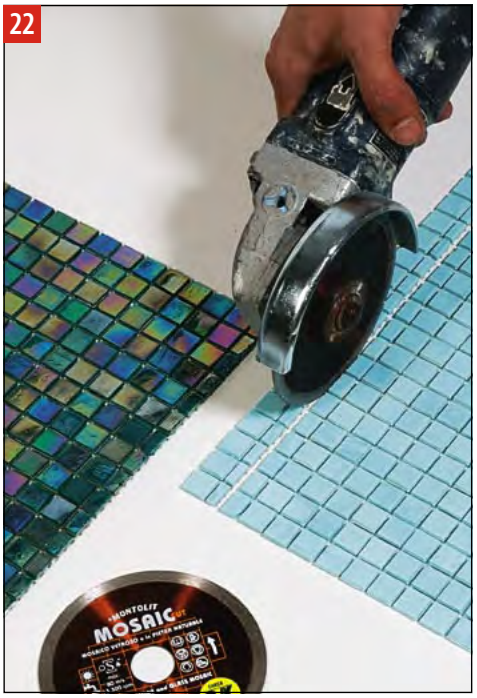

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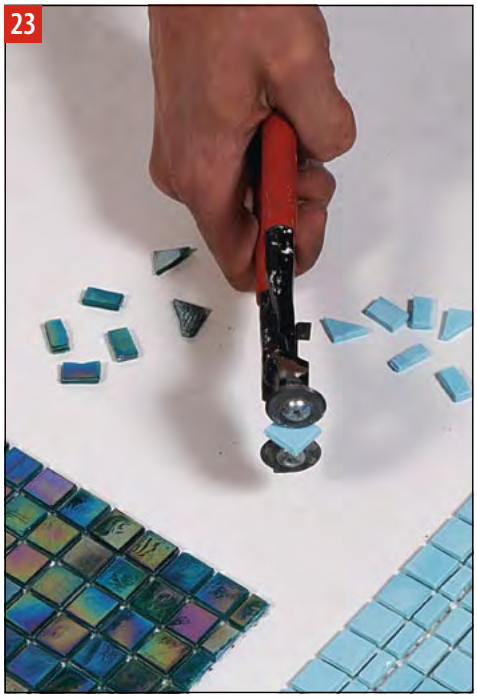

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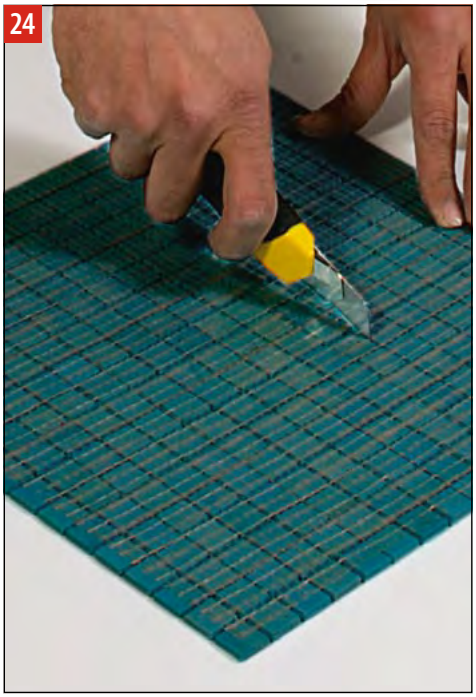

ATTREZZATURE · EQUIPMENT · OUTILS
HERRAMIENTAS · WERKZEUGE · УКЛАДКА

ATTREZZATURA (A) Frusta elicoidale per miscelazione del collante e sigillante (B) Set di cazzuole e spatole in acciaio inox (C) Spatola liscia, dente quadro mm 3 e mm 5 in acciaio inox (D) Cutter (E) Set di misurazione (metro, matite, traccia-linee etc) (F) Frattazzo in gomma per battitura fogli e stuccatura (G) Set di spugne in cellulosa specifiche per la pulizia di prodotti epossidici (H) Disco da taglio diamantato a corona continua montato su smerigliatrice angolare (I) Tenaglia da taglio manuale per vetro (L) Termoventilatore per rimozione pellicola adesiva.

EQUIPMENT (A) Helicoidal whisk to mix binder and sealer (B) Stainless steel squeegees and trowels (C) Smoothe squeegee, stainless steel square tooth mm 3 and mm 5 (D) Cutter (E) Measuring set (metre, pencils, ruler) (F) Rubber plasterer's trowel to flatten and plaster sheets (G) Cellulose sponges set fit for cleaning epoxy materials (H) Continuous gear diamond lapping wheel placed on angular sanding machine (I) Pincer for manual cutting fit for glass (L) Fan for adhesive film removal.

OUTILS (A) Fouet hélicoïdal pour mélanger l'adhésif et la colle à sceller (B) Set truelles et spatules en acier inox (C) Spatule lisse avec dents carré mm 3 et mm 5 en acier inox (D) Cutter (E) Set instruments mesurage (mètre, crayon, rénette) (F) Taloche en caoutchouc pour battage feuilles et stucage (G) Set éponges en cellulose spécifique pour nettoyage produits à base d'epoxy (H) Disque diamant à couper à couronne continu installé sur ponceuse angulaire (I) Tenaille manuelle pour verre (L) Ventilateur thermique pour hôter la péllicule adhésive.

HERRAMIENTAS (A) Mezcladora para cemento cola y material de rejuntar (B) Paleta albañil rectangular (C) Espátula lisa con diente cuadrado de 3-5 mm en acero inox (D) Cutter (E) Metro (F) Llana con base de goma para igualar y rejuntar (G) Conjunto de esponjas de celulosa específicas para la limpieza de productos eposídicos (H) Disco de corte diamantado de banda continua (I) Tenazas de corte manual de vidrio (L) Termoventilador para despegar película adhesiva (secador).

WERKZEUGE (A) Spiralförmiges Rührgerät zum mischen des Klebers und des Fugenmörtels (B) Satz Glättekelle und Spachtel aus Edelstahl (C) Glatte, 3 mm und 5 mm-Zahnungspachtel aus Edelstahl (D) Cutter (E) Messgeräte (Zollstock, Bleistift, Lineal, usw) (F) Reibebrett aus Gummi für das Klopfen der Mosaikmatten und die Verfugung (G) Satz Spezialfliesenschwamm zur Entfernung von Epoxy Produkten (H) Zahnlose Trennscheibe auf Winkelschleifer montiert (I) Mosaikzange zum manuellen Glasschneiden (L) Heißluftpistole zur Entfernung der Schutzfolie.

УКЛАДКА (A) Миксер для смешивания клея и затирки (B) Мастерки и шпатели из нержавейки (C) Шпатель с 3-х мм и 5-ти мм зубцами, из нержавейки (D) Нож (E) Измерительные инструменты (рулетка, карандаш) (F) Полиуретановый шпатель для укладки листов мозаики и затирки (G) Губки целлюлозные для удаления эпоксидных остатков (H) Диск с алмазным распылением и гладкими краями (I) Кусачки для стеклянной мозаики (L) Фён для устранения клейкой плёнки.