VETRITE®

Technical and laying information

SICIS
THE ART MOSAIC FACTORY

This technical document aims to provide suggestions for the correct installation of the VETRITE slabs produced by Sicis and tips on how to choose the most suitable materials (adhesives and mortars for sealing the joints manufactured by Litokol S.p.A.) for posing the slabs inside both residential and public/commercial buildings, to cover floors and walls.

TECHNICAL DESCRIPTION OF VETRITE

VETRITE is a decorative technical glass slab, which is obtained by pressing together polymers in liquid phase, metal foils and textile fibres. The result is a versatile, high-tech composite that can be used to meet the most ambitious aesthetic, technical and environment requirements. Standard thickness 6 mm; on request, it can be made for special applications in a thickness of 4 to 16 mm. For flooring, a thickness of 10 mm is recommended with the Sicisgrip finish.

VETRITE AND THE ENVIRONMENT

The versatility of the VETRITE technology makes it possible to supply the product, **on request**, using special glass that is pre-treated to make it self-cleaning, anti-bacterial etc. The special easy-cleaning types of glass have a thin, transparent layer that gives the glass photocatalytic and hydrophilic properties that are very effective in keeping the surface clean. The photocatalytic layer exploits the combined action of the UV rays of sunlight with water to remove any dirt that accumulates on the surface of the glass. The use of these special pre-treated types of glass is not recommended for flooring.

TRANSPORT AND STORAGE

VETRITE must be transported and handled with care, in full awareness that the material consists of slabs of glass.
During all phases of transportation, temporary warehousing, long-term storage and storage on the building site, care must be taken to ensure that the stillage holding the VETRITE is always placed on a perfectly flat floor and that the slabs are not exposed to any risk of being grazed, scratched or broken.
The storage areas should be protected from the sun and adverse weather conditions.
We recommend storing at a temperature of between 15°C and 25°C / 59 F – 77 F and a relative humidity of less than 80%.
The wooden stillages supplied with VETRITE are intended for transportation only and not for long-term storage as, over time, they might cause the slabs to warp slightly. Before use, lay the slabs on a horizontal surface until they return to their original flatness.
Alternatively, when laying or cutting the slabs, make them flat again using weights until the adhesive has hardened, or until they have been fully cut. The VETRITE slabs may warp if they are stored for a long period of time resting on only 2 points.
Therefore, the slabs must be stored in purpose-built classifiers/folders, inserting spacers between the slabs, also taking their dimensions into account.
We recommend ensuring that any stored slabs are rotated in the best possible way.
The slabs must be handled using suitable equipment (glass vacuum lifters, suction cups etc.). All lifting equipment must meet the current laws and standards and be approved by the competent authorities. For your easy consultancy we are listing the name of some suppliers promoting and marketing the handling, and installing tools available in the market. Raimondi SpA http://www.raimondispa.com - Montolit www.montolit.com

The vacuum lifter must be properly cantered. The slab must be first lifted, then moved. Avoid scratching due to contact between the edge of one slab and the surface of another.

Slabs with any traces of condensation due to the variations of temperature during transport must be dried or used as soon as possible.

QUALITY ASSESSMENT

Inspection and quality methods: VETRITE must be checked in the vertical position, with the naked eye and in normal conditions of diffused light (natural or artificial, between 300 lx and 600 lx), standing at a distance of 1 m.
The direction of observation must be perpendicular to the glass slab. It is not suggested and neither permitted to use a source of additional light, such as a reflector because it may drive a wrong analyse.

SIZE REQUIREMENTS

For sizes below or equal to 2000 mm, the standard tolerance from the nominal size is +/- 1 mm. For sizes above 2000 mm, the standard tolerance from the nominal size is +/- 1.5 mm. The tolerance depends on the maximum dimensions of the slab. The tolerance of orthogonality is expressed as the difference in length between the diagonals of the slab. For slabs of which both dimensions are below or equal to 2000 mm, the difference must not exceed 3 mm. For slabs of which one (or both) dimensions above 2000 mm, the difference must not exceed 4 mm.

GENERAL INSTRUCTIONS

Geometric patterns in the VETRITE decorations: It is not possible to guarantee that the patterns of the VETRITE finish are perfectly parallel with the edges of the slab. In Standard productions, it is not possible to guarantee the continuity of the pattern or textures where several slabs are placed in a row. There may be a slight reflection or light wrinkles near to the edges of the VETRITE slabs. This effect is inherent to the product and is more noticeable in the case of darker shades. Occasional polymeric residues inside the plates may be small halos and these are characteristics of the melting process and as such to be accepted.
Various colours of VETRITE have a pleasant effect on the back of the slab that can be similar to the colour itself and to other finishes in the collection. Make sure that vetrite is installed the right way round, with the side requested by the client visible. Here is a list containing just a few examples of the colours with this characteristic: Feather Black, Feather Champagne, Astrakan Pavone, Dragon Sparrago etc. The list is not complete.
VETRITE can be shaped directly on-site. Please watch the relative tutorial videos available on the Internet.
https://www.sicisvetrite.com/eng/Video
Once the VETRITE has been cut and drilled as necessary, the edges must always be filed; this reduces risks of injury to people and eliminates any micro cracks that can form during the cutting and drilling phase.
After laying, micro cracks can gradually spread if they are not removed during installation.
The main causes of the spreading of cracks include:

- Excessive pressure applied when tightening bolts and accessories (taps/locks/wall-mounted sanitary fixtures/electric sockets etc.). To reduce or eliminate this risk, always use controlled tightening tools (ratchets or torque wrenches).
- Structural movements of the substrates caused by:
  - Dilation of the substrates due to variations of humidity in the surrounding atmosphere.
  - Continuous vibrations due to the proximity to infrastructure subject to heavy traffic.
  - Use of wall-mounted sanitary fixtures, shelves, coat racks, lamps and in general, any furnishing elements that are fixed to the wall using unstable anchoring systems. (see dedicated section)
  - Normal settlements and/or natural phenomena.

We recommend not to make slots or notches with sharp corners on VETRITE slabs. Corners must always be perfectly rounded (we recommend a minimum radius of 3 mm).
If you request VETRITE to be supplied with slots or notches, these will always be rounded.
The VETRITE slabs can have certain effects on the back depending on the shaping, edge finishing etc. These effects do not spoil the appearance or functionality of the product once installed.

INSTRUCTIONS FOR THE APPLICATION OF VETRITE IN THE PRESENCE OF WALL-MOUNTED FURISHING ELEMENTS

Wall-mounted furnishing elements generally include: shelves, coat racks, light fixtures, other electric/electronic devices, plumbing components (wall-mounted sanitary fixtures, heated towel rails, boilers, etc.).
As an example, in this document detailed instructions are provided for the application of VETRITE together with wall-mounted sanitary fixtures. The basic principles given here should be extended to all the other cases.
This application must be carried out by experienced professional fitters.
VETRITE must be installed on a stable, firm substrate. If wall-mounted elements are planned, adhesive must be applied to the entire surface of the substrate, avoiding any empty spaces between VETRITE and the substrate in proximity to the anchorage points.

EXAMPLE OF APPLICATION OF VETRITE TOGETHER WITH WALL-MOUNTED SANITARY FIXTURES

Wall-mounted sanitary fixtures involve the use of anchoring systems that guarantee the required load resistance, but do not always ensure the perfect stability of the sanitary fixtures themselves.
Depending on how the anchoring system has been fixed (number of anchorage points, distance of the frame from the sanitary fixture, etc.), there may be slight movements of the frame/bar and consequently the fixture itself.
When the sanitary fixtures are used, the entire weight can be concentrated in a single point of the VETRITE wall covering, causing it to break.
Below, we have provided some suggestions on how to make the frame and consequently the sanitary fixture more stable, in order to reduce/eliminate any risk of breakage of the VETRITE slab.

Figure 1 shows a typical anchoring system for wall-mounted sanitary fixtures that are generally available in the stores.

Fig. 1. Example of anchoring system of wall-mounted sanitary fixtures

These articles are typically supplied with the materials necessary to anchor the frame in 4 points:
- 2 points at the top, on the wall, on the outside of the vertical brackets.
- 2 points at the bottom on the floor, in the centre of each horizontal bracket.

Using only the materials for 4 anchorage points supplied by the manufacturer, it is not possible to ensure the perfect stability of the wall-mounted sanitary fixtures.
It is thus necessary to add 2 more anchorage points, towards the top and inside the brackets, using two L-shaped profiles and anchoring them symmetrically on the wall, exploiting the existing holes.

We strongly recommend you to:
- anchor the frame in 6 points and not only 4 points, as described above;
- check the flatness of the sanitary fixtures on the surface to which they are to be mounted, before installation;
- use the noise reduction gaskets (see fig. 2), which also act as a seal, distribute the load, and compensate for any small differences of flatness of the sanitary fixture;
- use controlled tightening tools (ratchets or torque wrenches);
- keep the number of holes in the VETRITE slab to a minimum. We advise drilling a single, large hole (smaller than the surface of the sanitary fixture), rather than drilling the 4 smaller holes (see example in fig. 3 showing the water inlet and outlet pipes and the two holes for the support brackets);
- always file the edge around any holes/cuts made during installation.
- do not make slots or notches with sharp corners, but always ensure these are rounded.

Fig. 2. Noise reduction gasket

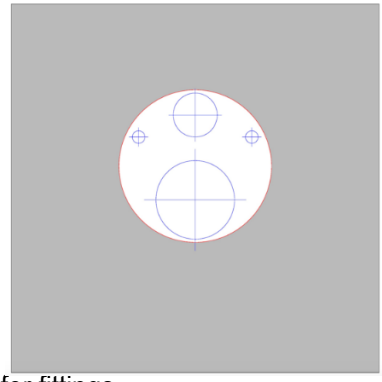

Fig. 3. Single hole for fittings

FOCUS ON MANUAL CUTTING OF VETRITE

If VETRITE has to be cut manually, it is essential to observe the following recommendations and precautions:

- the cutting marks must be made and coincide perfectly on both sides;
- the pressure parameters, wheel size, speed etc. must be established on the basis of the thickness of each slab, depending on whether it is to be installed on the floor or a wall;
- the cutting line must be lubricated with a suitable type of oil that is sufficiently volatile and easy to wash off;
- the breakout must be made independently on each slab and be adjusted in such a way to prevent the surface from flaking;
- the decorative polymeric films can be separated by cutting with a razor blade;
- always prevent the formation of flakes;
- once cut, the slabs must be kept separate using purpose-built separators;
- watch the relative tutorial videos available on the Internet https://www.sicisvetrite.com/eng/Video

Work conditions:

- cutting staff must wear clean gloves;
- all equipment, work benches, conveyor belts etc. that may come into contact with VETRITE must be kept clean at all times;
- if the slabs are cut using templates, ensure that they are scrupulously clean;
- any personalised cuts in more than two slabs of VETRITE can only be carried out using a Waterjet cutter.

Before installation, the VETRITE must be cleaned using clean water, if necessary with a small quantity of neutral detergent.
Avoid any acid and/or abrasive detergents (in particular those containing hydrofluoric acid)
Before cleaning, eliminate any residues that might scratch the surface of the glass (grains of sand, fragments of glass, particles of rust).
In the case of automated cleaning, to prevent any damage to the glass surface it is necessary to regularly check the level of hardness and cleanliness of the brushes, the washing equipment and the water used for washing.
Dry VETRITE immediately after cleaning.

LAYING VETRITE

In terms of application, the VETRITE slabs can be considered on a par with ceramic elements. For this reason, the planning and actual laying of the slabs must be carried out in line with the national regulations and standards for the installation of ceramic materials in each country, such as the Italian standard UNI 11493, which provides the indications necessary to ensure that the required levels of quality, performance and durability are reached. For the installation of large formats (slabs with a length equal to or exceeding 59.3 cm), we recommend referring to paragraph 7.13.8 of the standard UNI 11493.
As an example, we have provided below some requirements that should be followed in general.

Substrates
Before laying, check that the substrates are clean, free of any loose parts, sufficiently dry and cured, flat and at the right height, and have an adequate level of mechanical resistance.
Site conditions - Check that the conditions of temperature 15°C and 25°C / 59 F – 77 F, humidity, light, etc. are adequate at the time when the products are installed.
Materials
Check that all the materials used during installation (slabs, levelling compounds, skim coats, adhesives, sealants, waterproofing products, etc.) are suitable for the intended use and correctly stored.
Dilation joints
Check that all dilation joints, that serve the purpose of absorbing any movements/vibrations of the wall, have been properly planned and arranged. In general, these joints are sealed with a neutral curing silicone.
Single adhesive coating
Installations that envisage a single coating (application of adhesive to the substrate only) are permitted for formats that are applied to walls, with their longest side measuring less than 59.3 cm, and only on stable supports that are not exposed to vibrations and/or dimensional movements or dilation. The grooves on the adhesive spatula must in any case ensure that the adhesive is spread evenly over the substrate, with a coverage of 70-80% of the slab.
Double adhesive coating
For the installation of large formats (slabs with a length equal to or exceeding 59.3 cm), which are to be installed on the floor or in wet rooms/swimming pool areas, the adhesive must be applied both to the substrate and the back of the slabs, so that the adhesive covers the entire surface without leaving any gaps. For this reason, we recommend applying the adhesive to the substrate with a toothed spreader of 6x6 mm, and to the back of the slab using a toothed spreader of 3.5X3.5 mm.

Joints
The width of the joints will depend on the following parameters:
• the slab format;
• the mechanical characteristics of the substrate;
• the room and atmospheric conditions of the room in which the slabs are to be installed.

Pursuant to the standard UNI 11493, the slabs may not be installed without joints. Any plastic spacers must be removed before grouting.
To ensure that walls covered with large formats are perfectly flat, we recommend using self-levelling spacers.

CHOOSING THE ADHESIVE

Indoor walls in residential, public/commercial buildings	
Substrates	Adhesive
Plaster in lime/cement	Hyperflex K100 - Litoelastic
Gypsum-based plaster[1]	Hyperflex K100 - Litoelastic
Concrete poured directly during installation [2]	Hyperflex K100 - Litoelastic
Precast concrete	Hyperflex K100 - Litoelastic
Existing substrates consisting of old ceramic, mosaic or stone tiles [3]	Hyperflex K100 - Litoelastic
Substrates waterproofed with Hidroflex, Aquamaster, Elastocem, Coverflex	Hyperflex K100 - Litoelastic
Panels in cement and fibre cement	Hyperflex K100 - Litoelastic
Slabs of waterproof/non-waterproof plasterboard	Hyperflex K100 - Litoelastic
Lightweight panels	Hyperflex K100 - Litoelastic
Wooden or metallic surfaces	Litoelastic
Furnishing accessories	Litoelastic Neutral silicone
Indoor floors in residential, public/commercial buildings	
Substrates	Adhesive
Cement-based, seasoned screed, separate or floating	Hyperflex K100 - Litoelastic
Cement-based screed, heated after the pre-heating cycle	Hyperflex K100 - Litoelastic
Sanded anhydrite screed, treated with Primer C[1]	Hyperflex K100 - Litoelastic
Smoothed concrete	Hyperflex K100 - Litoelastic
Existing substrates consisting of old ceramic, mosaic or stone tiles [3]	Hyperflex K100 - Litoelastic
Wooden or metallic surfaces	Litoelastic
Wet rooms/indoor pool areas	
Substrates	Adhesive
Substrates waterproofed with Hidroflex, Aquamaster, Elastocem, Coverflex	Litoelastic

Key
(1) After treatment with Primer C in the case of Hyperflex K100. Maximum humidity = 0.5%
(2) Seasoning time: at least 6 months.
(3) After being cleaned and degreased with a solution of caustic soda or by sanding the surface.
(4) After treatment with Primer C for plasterboard that is not waterproof.

ADHESIVES

Hyperflex K100: Cement-based, single component adhesive in white or grey manufactured by Litokol S.p.A.: high-performance, extremely deformable, very low emission of volatile organic substances, no vertical slip and extended open time of class C2TE-S2 according to EN 12004 and EN 12002 for the installation of ceramic, natural stone and mosaics on both indoor and outdoor floors and walls. Suitable for tiles-on-tiles, heated flooring and installation on façades. Product developed using the new *Litokol Dust Reduction* system, which limits the amount of dust produced during the mixing phase.

Litoelastic: White reactive epoxy-polyurethane adhesive with two components in class R2T according to EN 12004, no vertical slip, suited to the installation of any type of ceramic, natural stone and mosaics on traditional substrates or difficult substrates, such as metallic, wooden and fibreglass substrates, on both indoor and outdoor floors and walls, manufactured by Litokol S.p.A. Suitable for overlapping tiles and heated flooring.

APPLICATION OF VETRITE IN WET ROOMS/INDOOR POOL AREAS

The VETRITE collection involves different production technologies and it is always wise to check with the sales manager in charge or the Sicis technical department before installation, during the planning stage.
Here are a few tips:

- The finishes that contain fabrics (Athena Gold, Bolis Grey etc., or which derive from the Sicis Tessere Collection or fabrics provided by the customers themselves), must be pointed out beforehand, if they are to be used in humid areas. In this case, the product supplied will undergo a special treatment, which will affect the appearance and colour of the fabric.
- The finishes that contain fibres are normally sold without any waterproofing treatment. During the life of the product, water and other liquid substances can be absorbed, affecting the appearance and colour of the fabric. This phenomenon can happen if the product is stored for an excessively long time outdoors, on the building site where water is used, or after installation, if it comes accidentally into contact with water (broken types, leakages etc.).
- In pool areas, depending on the size and design of the pool itself, the format and thickness of VETRITE can be chosen according to personal needs. It is possible, for example, to place slabs and mosaics of the same colour side-by-side in order to follow curved surfaces more effectively.
- For use in a pool, if the size of the VETRITE slabs is increased, we recommend increasing their thickness depending on the format. For formats in which the longer side exceeds 59.3 cm, we recommend a thickness of 10 mm in order to compensate the water pressure in either direction.
- In addition to the normal waterproofing systems, once the holes have been made for the water inlets/spotlights, we recommend sealing any gaps manually applying a layer of two-component epoxy-polyurethane adhesive such as Litoelastic produced by Litokol S.p.A., or a neutral silicone such as Ottoseal S70.
- VETRITE is recommended for indoor use, so also for pool areas it can only be used for internal applications. Outdoor use is not recommended.
- If VETRITE is used for floors, we always recommend a thickness of 10 mm. minimum
- The Satin finish of VETRITE makes the floor slip-resistant (R10).
- Floors treated with Sicisgrip 400 meet the slip-resistance characteristics required by the standard ANSI A137.

- As the slab is made of composite glass, during the planning phase we recommend studying in detail how to seal the edges of VETRITE using purpose-built Sicis glass - MOULDING - or Genesis type profiles in aluminium/steel (typically used in corners between the tread and risers of stairs).

For installation in wet areas, it is always necessary to use a waterproofing membrane. After waterproofing, we advise against applying a second coat of cement-based products. The two-component epoxy-polyurethane adhesive Litoelastic must be applied above the waterproof seal.

For the colours Alma, Aluminium, Antique, Antique Ocra, Antique Blue, Antique Green, Mirror, Vis One and Vis Two, it is necessary to use the two-component epoxy-polyurethane adhesive Litoelastic. For these colours, we advise against the use of cement-based adhesives and grouts, also in rooms that are not exposed to humidity. If the aforementioned colours are applied to lightweight panels to which a coat of cement-based product has been applied, it is always necessary to apply a waterproofing membrane before proceeding to install the slabs.

OPALESCENT FINISHES

The VETRITE collection includes opalescent colours, such as Feather Champagne, Elephant Panna, Elephant Calima, Feather Cipria, Iguana Calima, Elephant Tortora, Iguana Tortora, etc. The colour of these dyes may be affected when they come into contact with the adhesive, especially if it is not applied evenly. We advise carrying out a test by applying a small amount of adhesive to an area of the slab, before proceeding to install the slab, and to assess any aesthetic effects.

SEALING THE JOINTS

Before sealing the joints, ensure that as much adhesive as possible has been used, to prevent any adhesive from surfacing, as this would be visible in the transparent layer of the slab.
The joints can be sealed after at least 24 hours have passed after the installation of the VETRITE slabs. Joints should be sealed using the epoxy two-component mortar, Starlike by Litokol S.p.A.
For the final cleaning and to remove any halos of epoxy resin, use the detergent Litonet/Litonet Gel by Litokol S.p.A., 24 hours after grouting.

CLEANING AND MAINTENANCE

The accurate, regular cleaning of the surface will not only preserve their beauty but will maintain the characteristics.
The slabs must be cleaned manually or using suitable equipment, working from the top downwards.
We always recommend cleaning a small area of the surface first, to check that the detergent is suitable.
Do not spray detergent directly onto the surface of the material, but onto a soft, clean cloth.
Do not use any abrasive, aggressive detergents. Avoid detergents or chemical compounds containing hydrofluoric acid.

REMOVING SCRATCHES

VETRITE may become damaged if it is knocked or grazed, but it can be repaired using all the instruments available in stores that have been specially designed for removing scratches on glass.
Watch the tutorial videos available on the Internet https://www.sicisvetrite.com/eng/Video and consult the sales manager in charge for further information on the possible solutions available.
Always follow the instructions provided by the manufacturer of the scratch removal system, explaining how to use it properly and how it works.
The principle used by the manufacturers of scratch removal system is that of removing the part of glass around the damaged area until the maximum depth of the scratch is reached.
This operation is carried out using abrasive tools with different grain sizes.
After the scratch has been removed, the VETRITE surface will lose its glossy finish and will be opaque.
The glass will then have to be restored to its original condition by treating the surface by abrasion with gradually finer grain sizes in order to obtain a shiny finish.
The grain sizes normally used for this operation are 100, 180, 240, 320, 400…… up to the very finest size depending on the manufacturer of the scratch removal system for glass.
For this purpose, the surface must also be polished using pastes containing cerium oxide or mixtures of rare-earth oxides.

Scratches on VETRITE can be:

- Slight, with a depth of < 0.05 mm. In this case, the scratch is visible but not perceivable to the touch with a finger nail. This type of scratch can be removed by simply polishing the surface with pastes containing cerium oxide or mixtures of rare-earth oxides.
- Medium. In this case, the scratch is visible and is perceivable to the touch with a finger nail. Merely polishing the surface is no longer sufficient in this case, and it is necessary to abrade the surface of the glass. We recommend starting with a grain size of 240.
- Serious. In this case, if a finger nail is passed over the scratch, it will go inside the groove and a grain size of 100 is required.

In order not to compromise the final result, it is necessary to follow all the abrasion stages without skipping any steps.
In the case of doubt regarding the right grain size to choose, use the finest. For example, if grain size 240 does not work, try with 180.
Never use larger grain sizes to remove scratches that can be repaired with finer grain sizes.
The abrasion of the surface and the subsequent polishing can create an optical warped effect on the glass, which will be more evident the deeper the scratch.
After removing any scratches, this distortion may present an unpleasant appearance on VETRITE.
During the various phases, ensure that:

- The scratched area is identified and circled, for example using two L-shaped strips of adhesive tape, placed together to form an upturned T. This operation also serves to create an area to catch any residues during abrasion.
- Keep the abrasives flat and parallel to the surface of VETRITE.

- Apply a correct amount of pressure. Help yourself with the noise of the tool: if the pressure is too low (low noise), this will compromise the effectiveness of the removal system, if it is too high (high noise), it may damage the abrasives and VETRITE itself.
- Keep the temperature of the glass under control.

General observations:

- All suction cups must be perfectly clean.
- Before handling, check that the suction cups adhere properly to the surface.
- Prevent damage to the glass by using the specific protection materials in the points of contact.
- Guarantee at all times the safety of the staff carrying out the operations.
- Avoid the presence of unauthorised personnel in the manoeuvre areas.
- Provide the personnel with adequate equipment and individual protection.
- The personnel in charge must have received adequate training and must own past experience in installing porcelain and onix thin slabs.