STONEGLASS®

Manuale Tecnico

Techical Manual

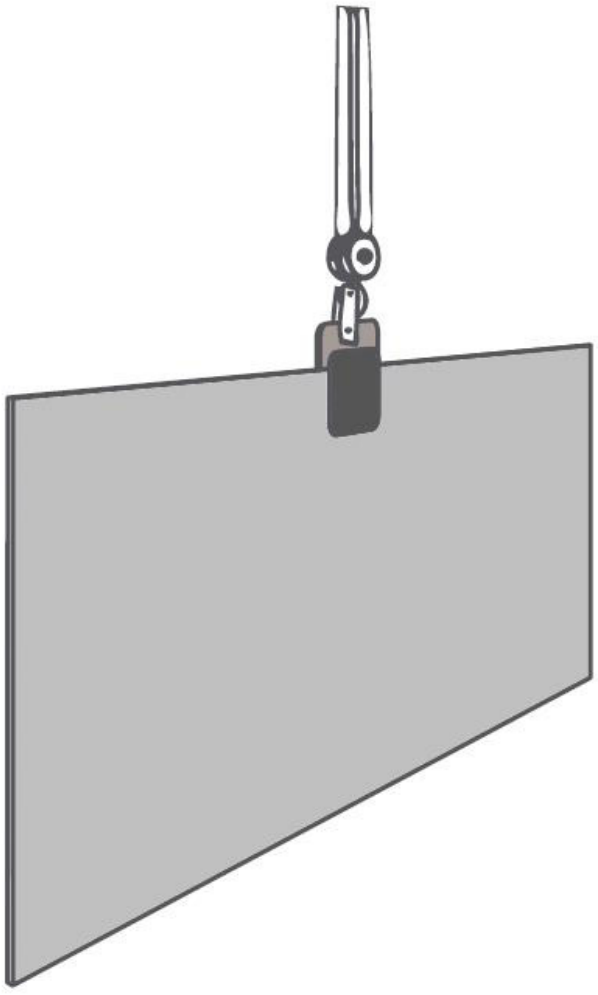
INDEX

Handling	2
Advice for design	3
Advice for manufacture	4
Waterjet's parameters	5
Blade cutting	6
CNC parameters	8
Advice for manual labor	12
Assembly with adhesives	13
Handling and installation countertops	15
Precautions for use	19
Cleaning and maintenance	20
Coverings and ventilated facades	21
Floors and claddings	23
Notes	33

HANDLING

You should always handle the slabs with maximum care and attention in order to avoid the damage of material.
Here below appropriate precautions and recommendations:

- the single slab can be moved through canvas belts covered with rubber, pincers covered with rubber or suckers;
- don't use chains or steel cables which may destroy the material;
- for taking a single slab it is recommended to arrange the gripper in the middle of the load to balance the weight and to limit the oscillation (as shown in figure);
- make sure that between the previous slab and the one that has just deposited there is no empty space.

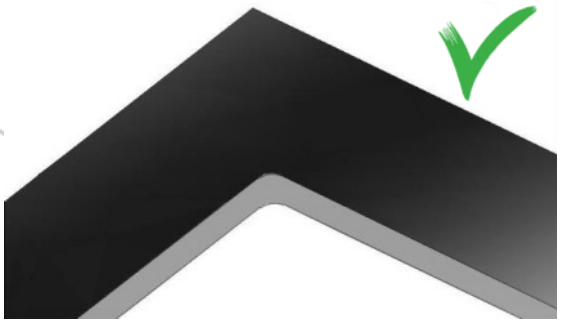


Check always the maximum load capacity

ADVICE FOR DESIGN

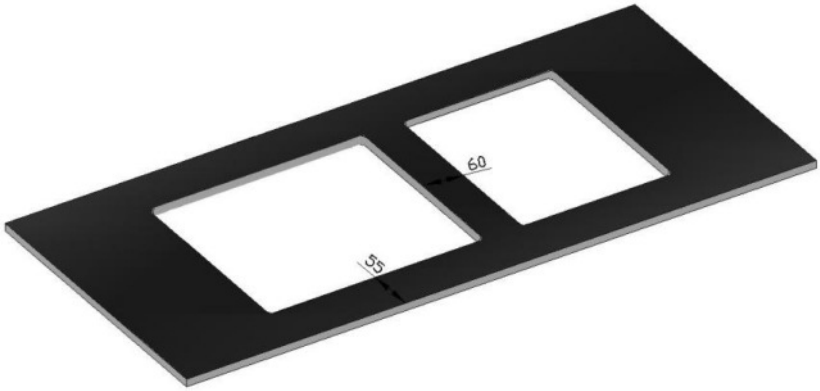
1. INNER CORNERS

All inner corners should have a minimum radius ≥ 5mm.
A larger radius gives a greater structural strength, on the contrary, any corner without radius produces a stress point on the top.



2. MINIMUM DISTANCE BETWEEN EDGES AND HOLES

The minimum recommended distance between edges of top and inner holes is 55mm.
The minimum distance between two inner holes is 60mm.



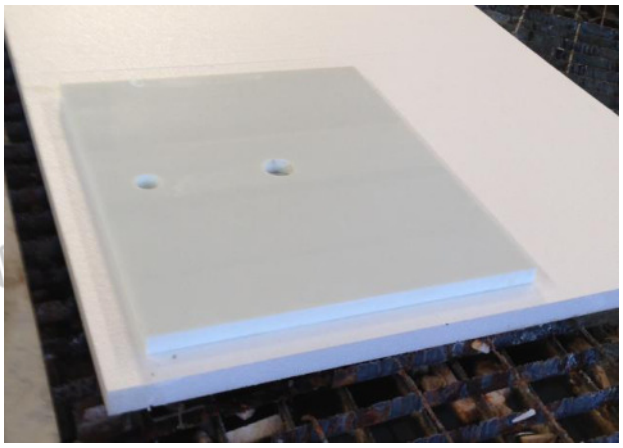
ADVICE FOR MANUFACTURE

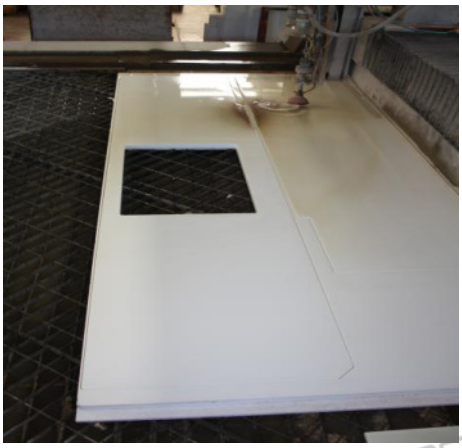
One of features of Stoneglass®2.0, is the easy workability. You can use the most common machines that are used for working glass and marbles.
Below some examples of cutting/finishing operations with related recommended parameters. You must conside these parameters indicative because they may change on the basis of the machine and tools used.

During all processing steps it's important that the Stoneglass®2.0 slab is always placed on a even surface or on calibrated sucker, this because any gap during the manufacturing process may create tensions that may cause breaking of the material.

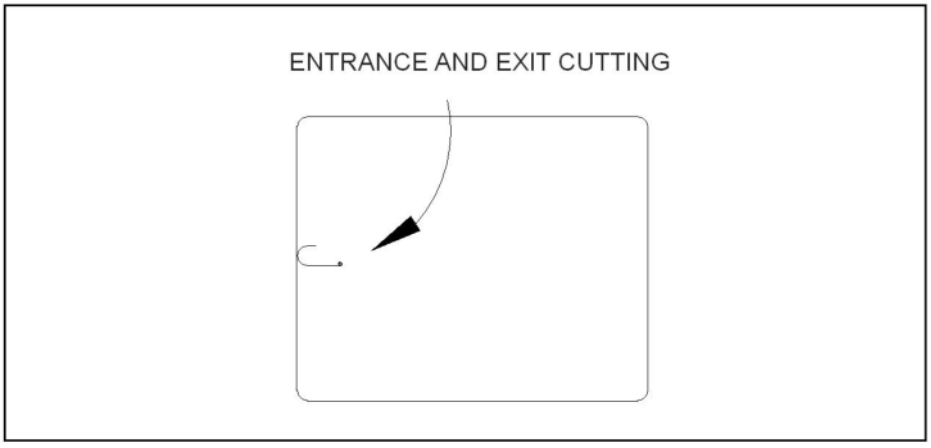
1. WATERJET CUTTING

We recommended to put the Stoneglass®2.0 slab over a polystyrene sheet in order to reduce any difference in level (recommended thickness 2cm, density 15/20).





Do the entry hole outside respect the slab. In alternative make the hole a few centimeters from cutting perimeter and in any case, never less then 5mm. For inner holes, do always the input and output hole internally respect the part that you want to cut.
Follow the below diagram.Low pressure input hole.



WATERJET'S PARAMETERS

PARAMETERS OF INPUT HOLE WITH LOW PRESSURE

SPESSORE	MINIMUM PRESSURE Bar	MINIMUM PRESSURE Mpa
12-15-18-30	700	70

PARAMETERS WITH HIGH PRESSURE

SPESSORE	MINIMUM PRESSURE CUTTING Bar / Mpa	STONEGLASS 2.0 PROGRESS PARAMETERS Cm/Min		STONEGLASS 2.0 PROGRESS PARAMETERS Cm/Min	
		Inner perimeter	Outer perimeter	Innner perimeter	Outer perimeter
12	2700 / 270	20	22	20	40
15-18	2700 / 270	16	18	15	30
30	2700 / 270	12	14	10	22

Those listed above are the recommended maximum value. To obtain a better finish, you must reduce the progress parameters.
Make sure your work surface is in good condition and flat; furthermore the piece must adhere perfectly to the plan without interference of waste or any other element of discontinuity.
For corners ≤ 90° it's recommended to connect the area with a radius ≥5mm.

ADVICE FOR MANUFACTURE

2. BLADE CUTTING

It's recommended to level the support's floor and to add under the Stoneglass®2.0 slab, a polystyrene sheet thick.20mm density 15/20 or in alternative a ground stone slab with thickness 2 cm. During the execution of the cut the blade has to sink into the underlying stone slab for at least 1 cm. In this way you avoid that the Stoneglass®2.0 slab suffers vibrations which may cause breakage.
For the execution of holes for sinks or hobs, it's recommended to make 4 holes (one for each corner) before proceeding with the cut both blade or end mill.
All profiles both internal or external must be properly shaped without chips or other flaws.

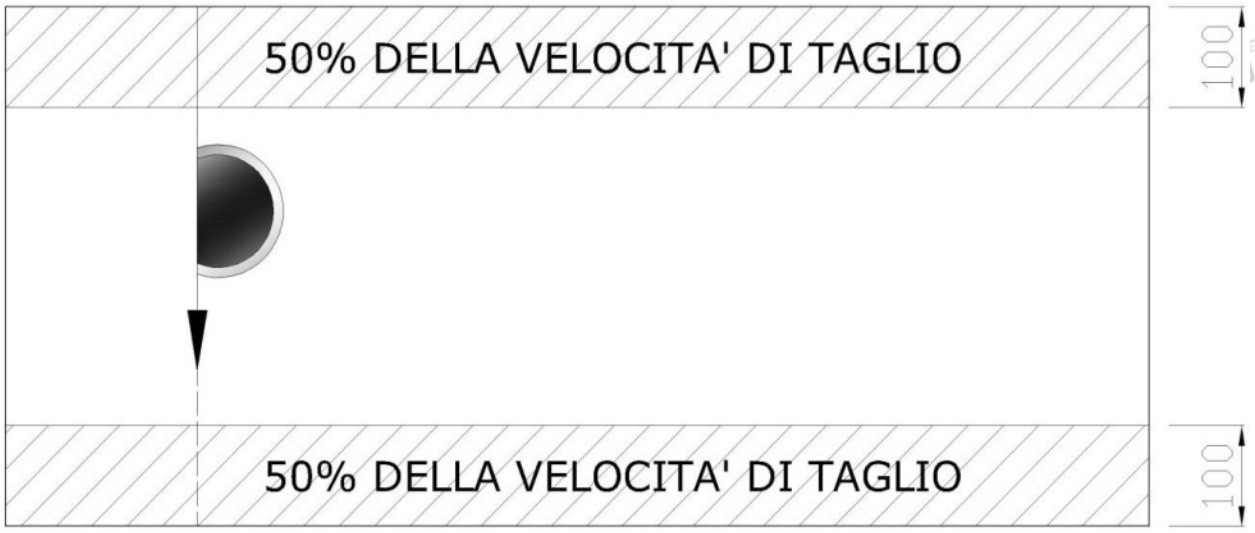
It's essential to use a suitable blade to cut Stoneglass®2.0 (see the picture).

Blade **MY STONEGLASS®**
BLADE 2.0
Cod: MY 400 (400mm)
MY 350 (350mm)
Hole: 60mm

For correct machining, consult the speeds and feed rates on the disc.
It is essential to lubricate the cut with water; the cutting disc must protrude at least 1cm below the plate.
It's recommended to revive the cutting blade with a sharpening bar every 10/15 cuts.

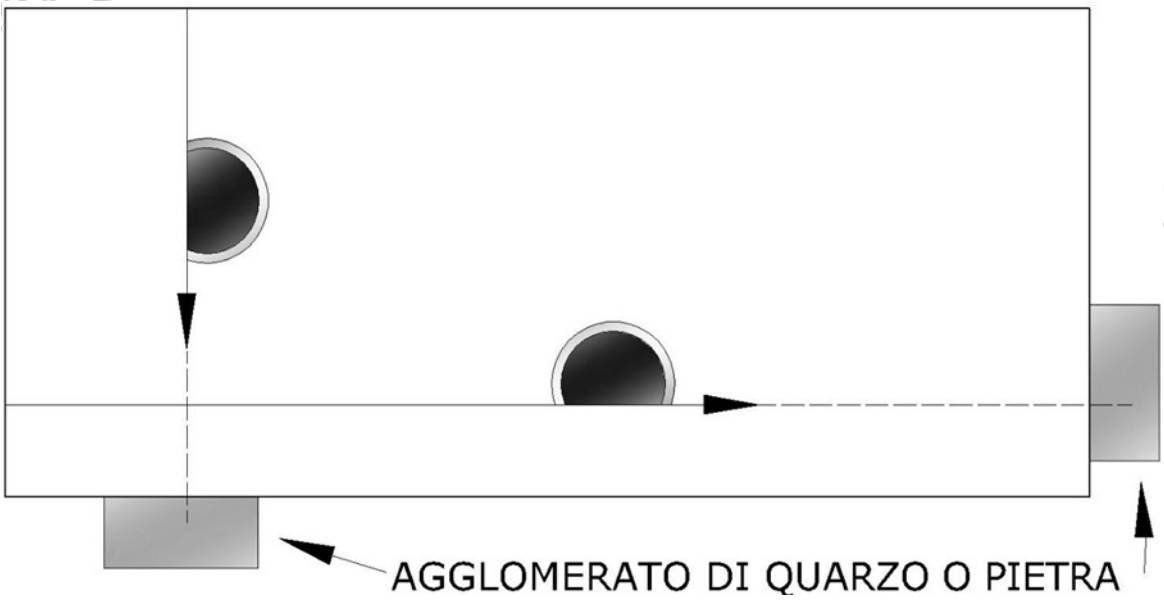
ADVISE FOR MANUFACTURE

Make sure that the table of cutting milling is in good condition and flat.



Slow down up to 50% of the incoming and outcoming progress for 100 mm speed.

It's recommended to place a piece of agglomerated of quartz or stone where disc goes out. This allows to limit the deviations of blade avoiding possible chipping.



<u>Important!!!</u>

For the Black Stoneglass® material, it is recommended to grind the top to avoid stresses that can cause breakage during the cutting and the insertion of polystyrene slabs between the top and the Black Stoneglass® slab. The cut must be made in steps with a 3/4mm descent using a MyStoneglass Blade 2.0 disc. This system guarantees a more refined perimeter cut.

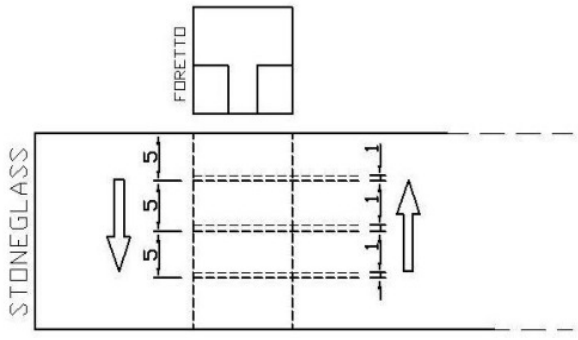
ADVISE FOR MANUFACTURE

3. CNC PARAMETERS

DRILLING TOOLS Ø22mm

THICKNESS	PROGRESS	ARBOR ROUND g/min
12	40	2400
15/18	40	2400
30	40	2400

During the execution of the holes it's recommended before to lower the tool of 5mm and then move it up to 1 mm. In this way it avoids the potential tool overheating which can cause the breakage of the piece and/or of the tool.



During processing it's recommended to use abundant well-directed water inside and outside of the tool. To avoid chips on the back of the piece, we recommended to stop at 1 mm from bottom and to complete the drilling with delicate hammering on the opposite side.

<u>Caution</u>
After each process it's recommended to rinse the surface with clean water.
We suggest to revive the tool with specific stone every 5 cuts.

ADVISE FOR MANUFACTURE

MILLING MACHINE Ø20mm

THICKNESS	PROGRESS	ARBOR ROUND g/min
12	400	11000
15/18	300	11000
30	200	11000

During processing it's recommended to use abundant well-directed water inside and outside of the tool.

Suggestions:

Any breakage is due to:

- too high speed of development;
- far fewer laps than the rated speed of the tool;
- insufficient cooling water.

During the cutting phase if the material weighs on a single point could create breaks. Make sure that the worktop and the suckers are adjusted in order to don't have difference in height which may create stresses and breakages during the successive steps.

ADVISE FOR MANUFACTURE

GRINDING WHEEL FOR LOWERING

THICKNESS	PROGRESS	ARBOR ROUND g/min
12	350	4000
15/18	350	4000
30	350	4000

Example:

ADVISE FOR MANUFACTURE

GRINDING WHEEL FOR LOWERING

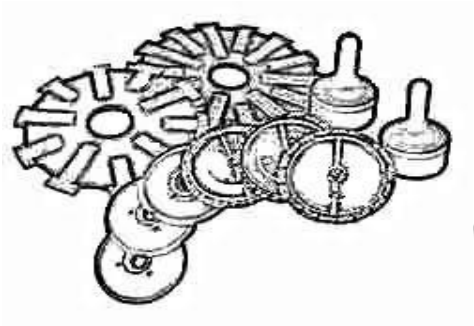
Flush top

THICKNESS	PROGRESS	ARBOR ROUND g/min
12	500	11000
15/18	500	11000
30	500	11000

Example:

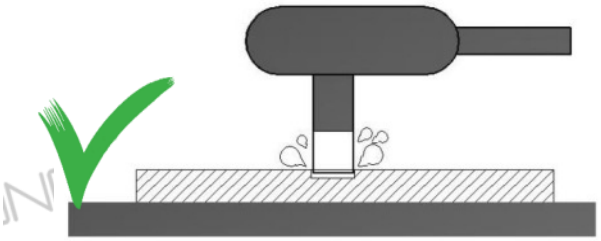
Due to the normal use of the tools, the dimensional tollerance is +/- 2 mm respect to the technical performance data are to be considered normal. The allowed tollerance for thickness of the material is set at +/- 1 mm than the nominal size.

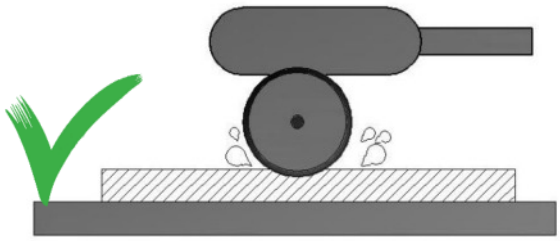
ADVISE FOR MANUAL LABOR

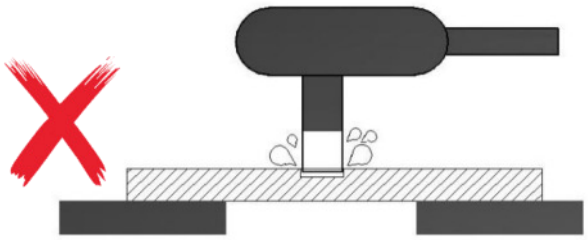


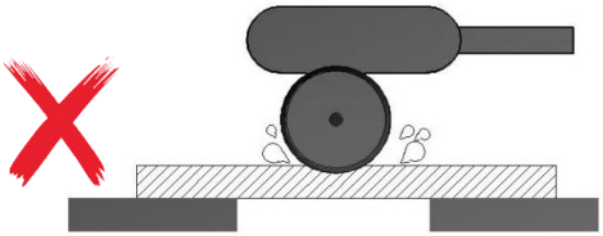
MANUAL LABOR

During any manual processing it's recommended to use a planar worktop in order to support the piece.
Furthermore it's recommended to always use abundant water.









We suggest to revive the cutting disc or the hole with revitalizing stone every 5 cuts.
For further info, we invite you to watch the following videos:

https://youtu.be/7nuE0hQ_Ic0 **drill**

http://youtu.be/AyIeBDCT3NQ **blade cutting**

ADHESIVES

PREPARATION OF SUPPORTS

Before applying the glue make sure that both surfaces are clean, well dry and free from any kind of treatment.
For gluing two 45° profiles we recommended you to don't finish the part to be bonded with polished wheels. The raw surface will ensure safe and durable bond. For more safety on the bonding at 45° it's a good norm to place a "L" profile mm 20x20 (about) on the back of the material (hidden) along the length of bonding of rise.

GLAXS CARTRIDGE 215ML

GLAXS is a very fast, coloured or transparent mastic for bonding ceramics, stoneware and similar materials. The product is packaged in special 2:1 ratio bi-cartridges of 215 ml. The two cartridge chambers include resin and hardener already pre-dosed. With the help of a special mixer spout and appropriate gun, it allows the correct dosing of the components without any effort. GLAXS is characterized by having an excellent adhesion in a very short time, 45-60min, allowing the cutting and polishing of the glued pieces. The hardened product has a smooth, shiny and well-polished surface. For indoor and outdoor use. It does not contain VOC and complies with LEED parameters.

TENAX

DATI TECNICI APPLICATIVI	
Viscosità cps 25°C 20 r.p.m (ASTM D2196)	
Densità a 25°C gr/cm³	
Aspetto	liquido colorato
Rapporto di uso mastice + indurente	2+1
Tempo di gel in massa a 25°C in min	3min-5min
Tempo di movimentazione pezzi	Circa 15 min
Tempo di lavorabilità consigliato a 25°C in min	Circa 45-60 min
Temperatura minima di reazione	+1°C
Temperatura minima utilizzo dopo indurimento	-25°C
Temperatura massima di utilizzo dopo indurimento	+60°C
Stabilità allo stoccaggio a 18-20°C	12 mesi
Forza di adesione in MPa a 25°C su ceramica taglio disco diamantato dopo 1 ora (ASTM D 4541)	11.0
Forza di adesione in MPa a 25°C su ceramica taglio disco diamantato dopo 30 gg (ASTM D 4541)	12.9

ADHESIVES

PREPARATION OF SUPPORTS

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PATTEX SP101 WHITE

We recommended to use this product for the creation of all elastic bonding and to seal.
Suitable for the construction works, joints, fastening of skirting, steps etc.
Once hardened the product, you can obtain an elastic bonding that offers excellent mechanical performance and an excellent adhesion.
You can use also to join two 45° profiles which don't require further manufacturing.

DATI TECNICI

Caratteristiche del prodotto prima della polimerizzazione

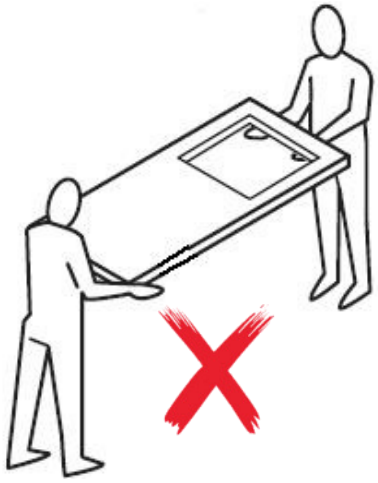
Base	Polimero flextec
Odore	Debolmente alcolico
Consistenza	Pasta tixotropica
Densità	ca. 1.37 g/ml
Perdita di tack	ca. 45 min
Tempo pelle	ca. 40 min.
Tempo di indurimento	2 – 3 mm/24 ore

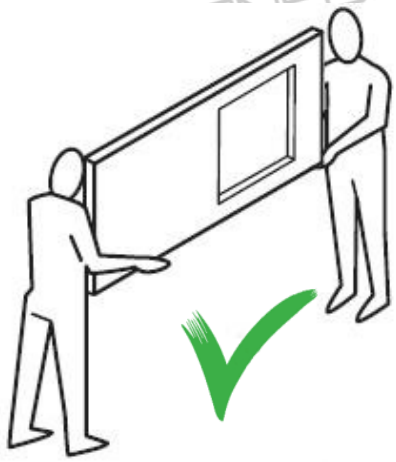
Caratteristiche del prodotto polimerizzato

Odore	Privo di odore
Durezza Shore A	ca. 53
Modulo a 100% di allungamento	ca. 1,10 N/mm^2 (ISO 8339)
Modulo a rottura	ca. 1,60 N/mm^2 (ISO 8339)
Allungamento a rottura	ca. 300 % (ISO 8339)
Ritorno elastico	ca. 90 % (ISO 7389)
Temperatura di esercizio	-30°C a +90°C

HANDLING AND INSTALLATION OF COUNTERTOPS

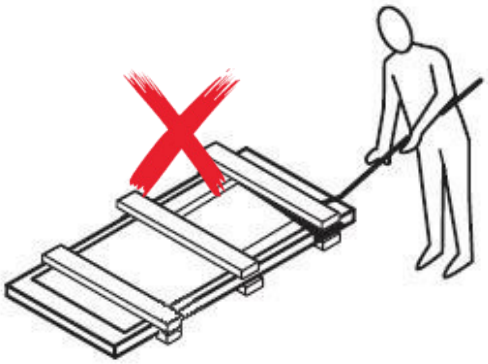
Pay maximum attention during all phases of handling.
You must ALWAYS move it in the vertical direction (knife way) and NEVER horizontally.

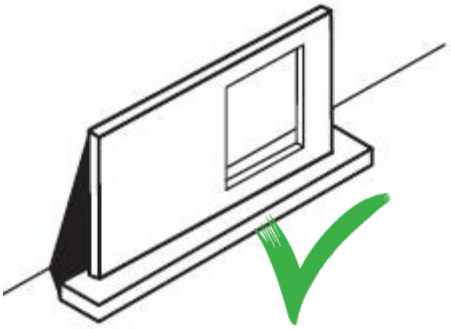


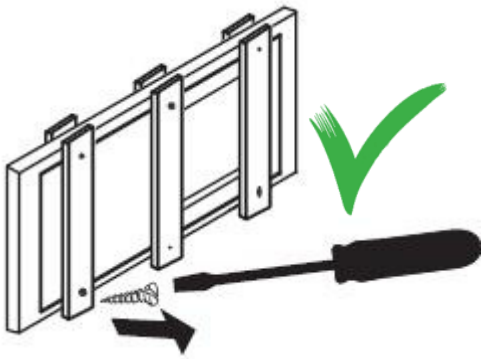


Keeping in VERTICAL way the top:

- Remove the screws;
- Remove the wooden box;
- Place the top in a delicate manner in vertical way.



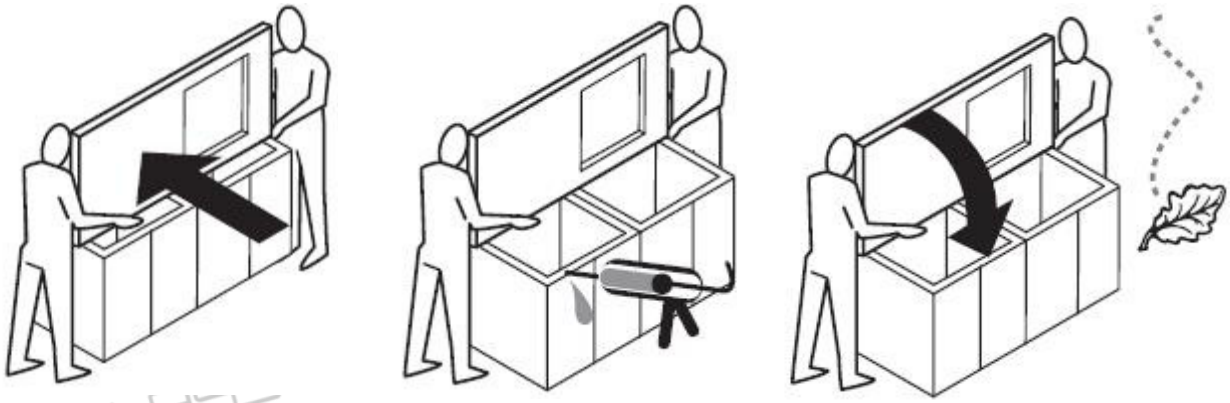




HANDLING AND INSTALLATION OF COUNTERTOPS

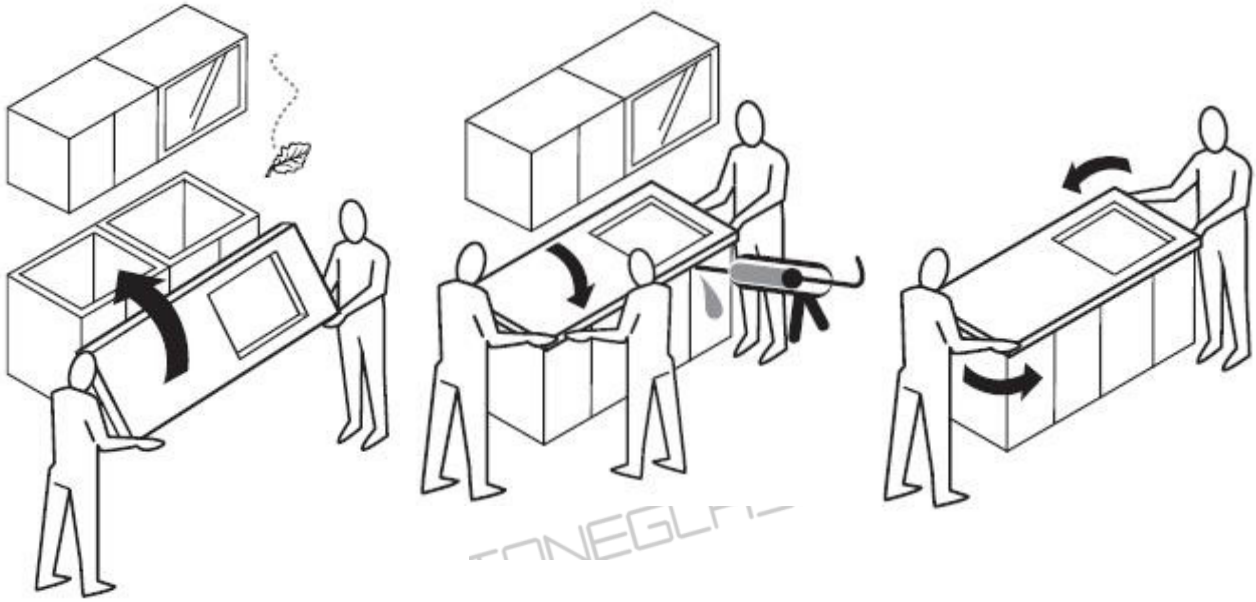
PLACEMENT WITHOUT WALL UNIT

In two or more people or with a suitable means of lifting, place the top in a delicate manner in vertical way and then push it against the wall.
In some points of perimeter put one or two drops of neutral silicone.
When you put down or pulling up the top in horizontally way be careful to don't burden the weight on one side but on whole length of the top.



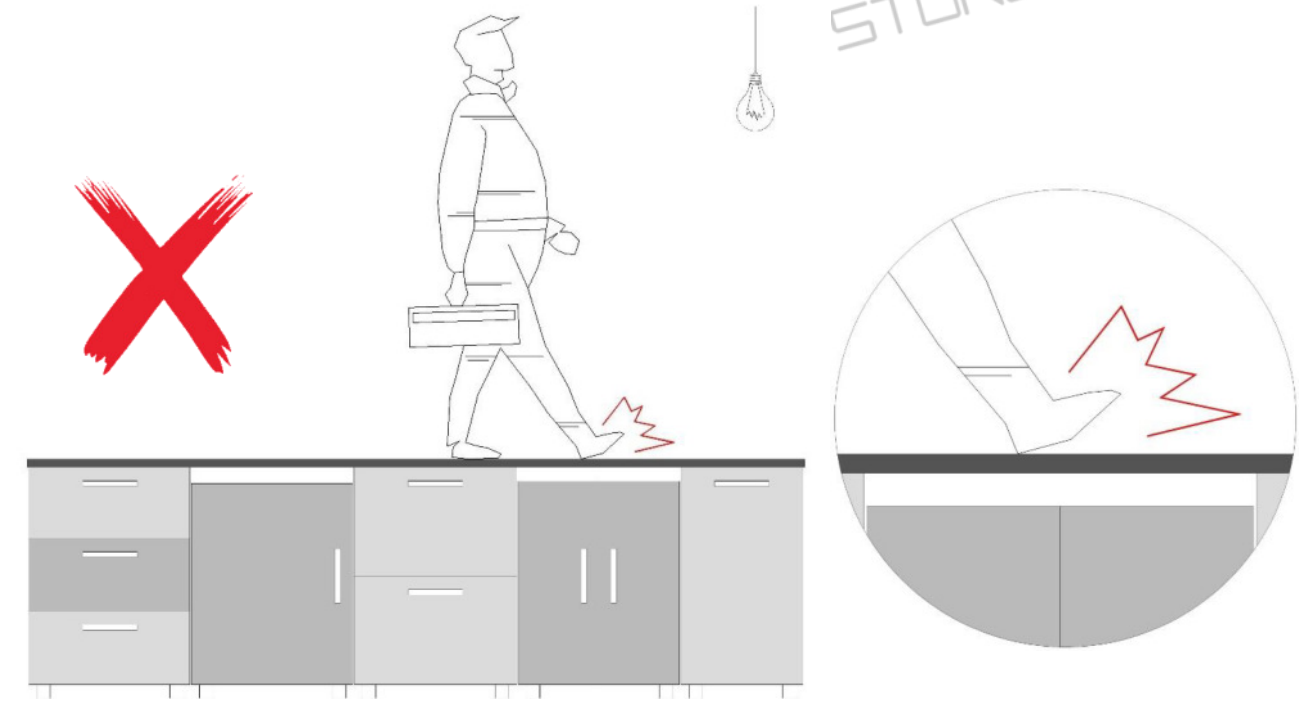
PLACEMENT WITH WALL UNITS

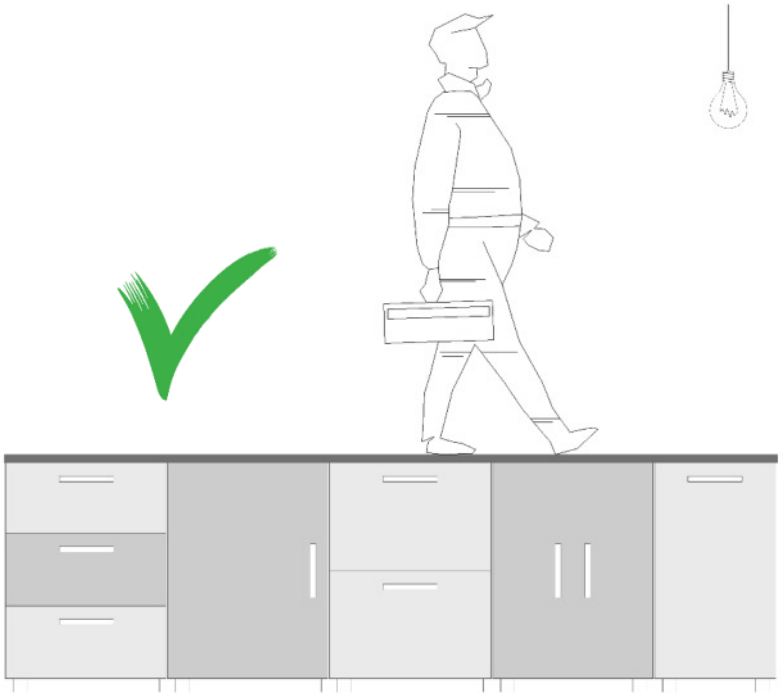
In two or more people or with a suitable means of lifting, be careful to don't damage the base, very gently place the top on it and place it above.
In two or more people, raise the Top and, being very careful not to force on one side but on the entire length of the top, put one or more drops of neutral silicone in some points of the perimeter of the base. Gently place the top on the base.



HANDLING AND INSTALLATION OF COUNTERTOPS

It's very important put the **Stoneglass®2.0** top on a planar, level and structurally solid base. Most of the cracks during the phases of assembly and post-installation are attributable to an irregular or inadequate support.

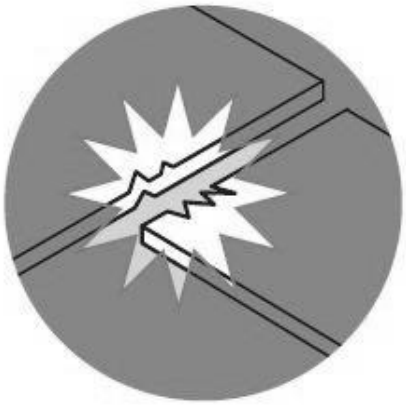




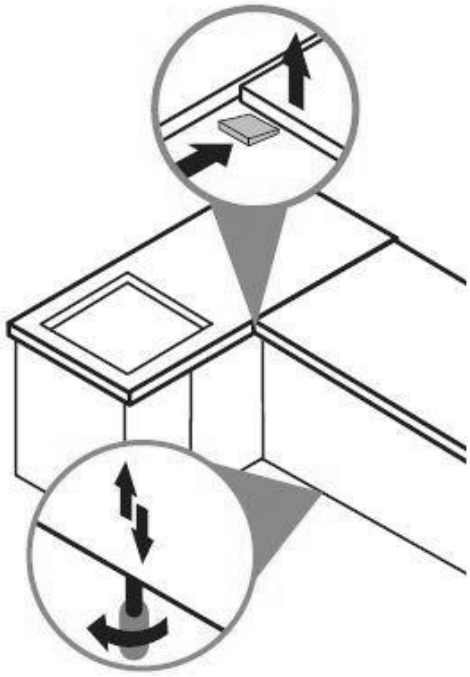
HANDLING AND INSTALLATION OF COUTERTOPS

PRECAUTIONS DURING THE ASSEMBLYING

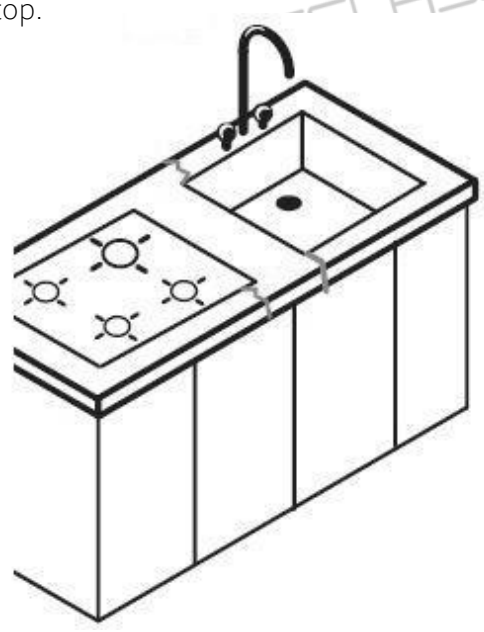
- Don't bump or beat the Stoneglass®2.0 top with heavy objects.
- Don't leave work objects, cleanser, adhesive etc. on the surface: they may damage or stain the surface.



- Put gently in contact two tops to avoid shock that could shatter both.
- Check for any difference between 2 or more tops. If necessary, level the tops using the adjustable feet of the bases and/or with the addition of the thicknesses.

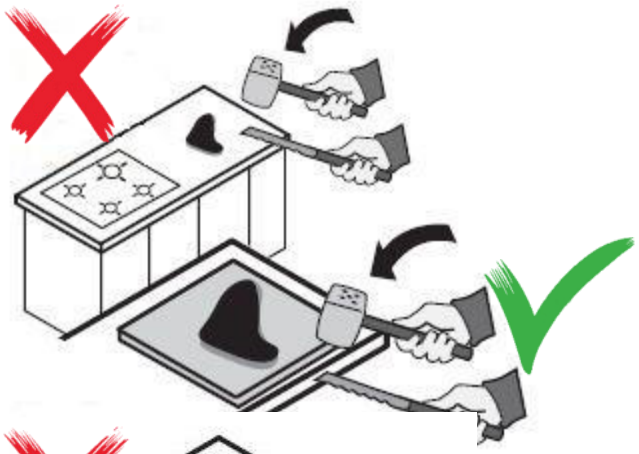


- Don't over tighten the tie-rod, because in the course of time, may create cracks near the holes; both on appliance and on sink, especially if it is under top.

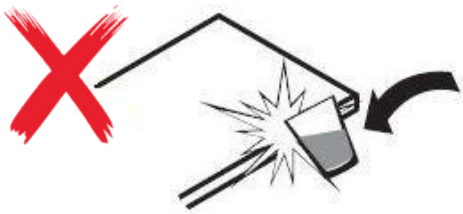


PRECAUTIONS FOR USE ON COUNTERTOPS

- Don't beat the meat or cut the food on surface directly. You must always protect the top with cutting boards or special countertops.

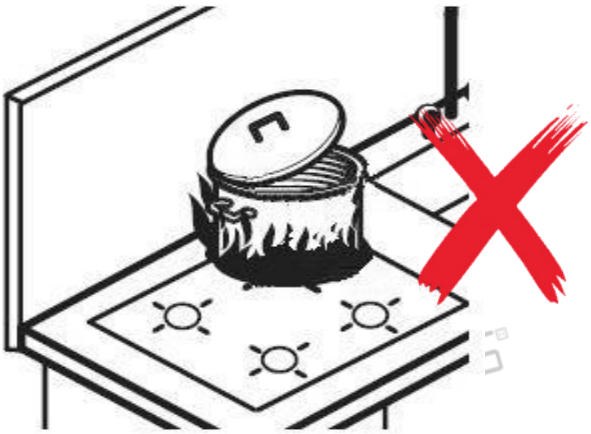


- Don't bump violently the countertop with heavy objects (bottles, glasses, dishes or pots) because it might chip.

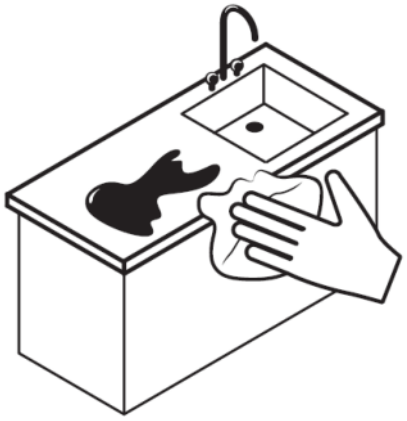


- Don't sit or climb on the countertop. Excessive weight (especially on large uncovered bases) can create cracks.

- Avoid direct contact with flames. Stoneglass® 2.0 is heat resistant, however it's recommended to avoid direct open fire on Stoneglass® 2.0 for a prolonged period because it can cause breakages.



CLEANING



For the ordinary cleaning of the Stoneglass® it is sufficient to use a damp cloth, otherwise here are the instructions to follow:

- Common glass cleaning products are effective for surface dirt;
- Stubborn dirt can be removed using degreasers or anti-limescale products;
- Avoid abrasive sponges, because they are not necessary;
- In the case of encrusted stains let the detergent act on the stain and remove it with a cloth.

Stoneglass® does not absorb and so you will find it simple to remove the scale.

Extraordinary maintenance

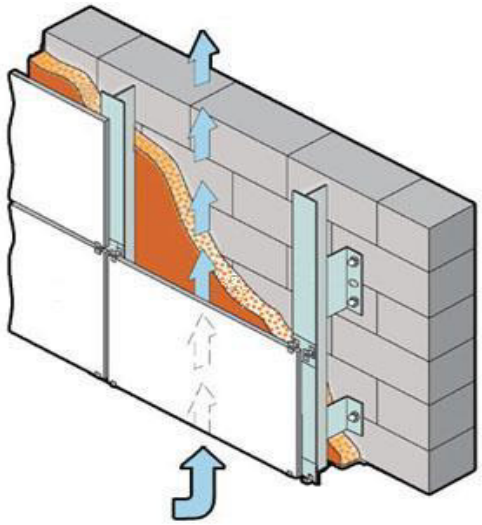
For the extraordinary maintenance of ink stains, paint or in general after the use of normal detergents for washable surfaces is not effective for the removal of the stain, a mixture of industrial acetone (30%) and water (70%) can be used.

Products to AVOID for the maintenance of Stoneglass®:

- Products with basic ph;
- Trichloroethylene;
- Industrial solvents;
- Solvents for paints;
- Hydrofluoric acid;
- Dichloromethane;
- Caustic soda.

COVERINGS AND VENTILATED FACADES

The ventilated façade (or ventilated wall) is a particular type of perimeter cladding of the walls that involves the dry application of panels of appropriate thickness, not strictly adherent to the structure, on the external surface of the building. The ventilated façade is essentially characterized by the position of the outer cladding layer, which does not adhere to the infill wall but is spaced to form a cavity. In this way, we obtain the natural air circulation in the space between walls due to the convective motion produced by existence of openings at the base and at the top of the façade.



Stoneglass®2.0, thanks to its technical/chemical characteristics and its high resistance to high temperatures, to frost and UV rays, is indicated for external applications as ventilated facades and floors.
Request any certifications.
You can use the same fixing systems for ventilated facades that are commonly used also for other materials (marble, ceramics etc.)
You must choose the sizes and thicknesses against technical study by a professional firm that will evaluate the test results, the type of supports, the type of installation, the environmental conditions etc.

VENTILATED FACADES SYSTEMS

The fixing systems for ventilated facades that you can be used are those commonly used also for other materials as marble, ceramics etc.
You must choose the sizes and thicknesses against technical study by a professional firm that will evaluate the test results, the type of supports, the type of installation, the environmental conditions etc.

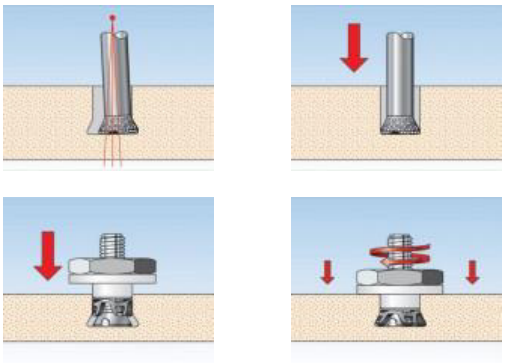
Here below some examples of systems tested on **Stoneglass®2.0** (on demand, we can give also the result of test):

1. Fischer;
2. Keil;
3. Specialinsert.

1. fischer

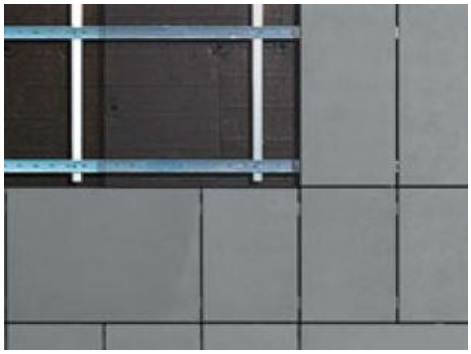
innovative solutions

For more info, visit the website http://www.fischeritalia.it



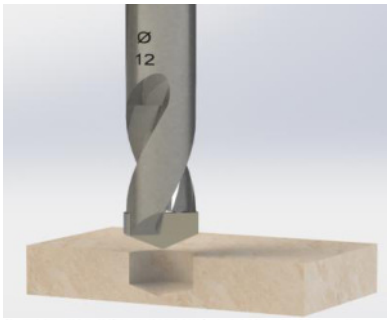
2. KEIL

For more info, visit the website http://www.keil.eu

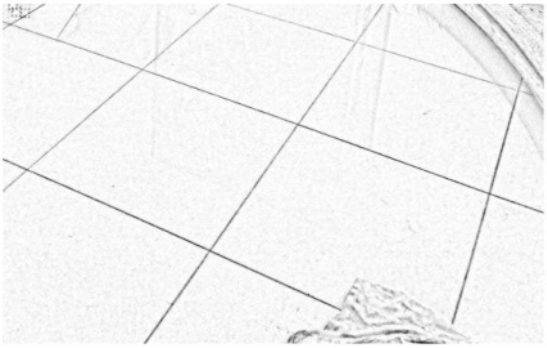


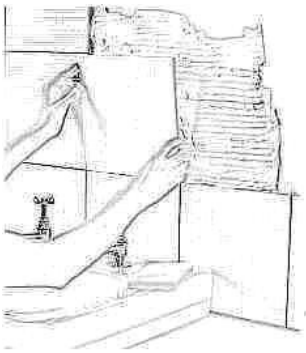
3. specialinsert

For more info, visit the website http://www.specialinsert.it



FLOORS AND CLADDINGS





LAYING BY ADHESIVES

Thanks to the collaboration with MAPEI world leader in products for the construction industry, we have prepared some guidelines to hold in consideration for a perfect installation of Stoneglass®2.0.

LAYING OF FLOORS AND COVERINGS

It is recommended to choose the size used according to the characteristics of the support on which to lay the Stoneglass®2.0 and according to the ability of the installers.

The supports on which to lay Stoneglass®2.0, besides being suitable to withstand the expected stress, must be a plane surface, cleaned, seasoned and in any case adequate and suitable to act as a base for gluing with the bonding agent depending on the technical specifications of the same adhesive.
Some guidelines to follow are indicated in this document for the preparation of supports and laying of Stoneglass®2.0 coatings.

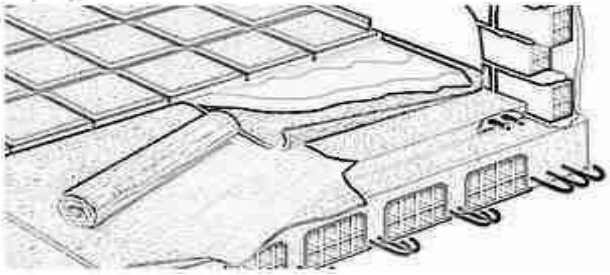
VERIFY THE SUBSTRATE

Before proceeding to the Stoneglass®2.0 laying it is necessary to make a thorough check of the supporting features. The verification criteria vary depending on the type of support on which you have to lay the installation.

SUBSTRATE IN CONCRETE

The supports will have to present clean, seasoned, dry and free from any substances which might affect following adhesions. The seasoning on a concrete slab can take several months and can vary considerably depending on the concrete mix, thickness, and environmental conditions.
Any cracks due to drying shrinkage of the support will have to be sealed by using a fluid two-component epoxy adhesive (type "Eporip" Mapei).
If the concrete support has a surface dusting, it is necessary to proceed to an adequate cleaning, followed by the application of suitable single-component primer based on acrylic resins in water dispersion with very low emission of volatile organic compounds - VOC (type "Primer g" or "Eco Prim T" of Mapei).

FLOORS AND CLADDINGS

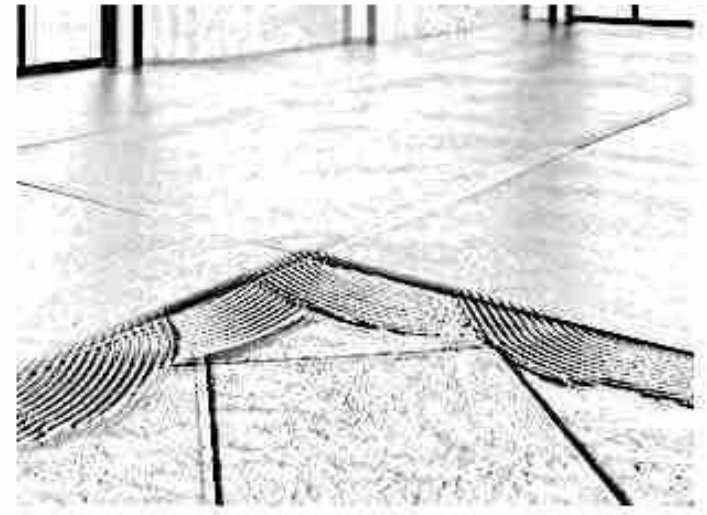


CEMENT SCREEDS

Basements you must be seasoned, clean, dry and free from any substance which might affect following adhesions.
The seasoning of a traditional cement basement takes about 7-10 days each centimetre of thickness. The drying may take a different timing depending on the water used to make the dough and environmental conditions. The timing can be conveniently reduced by using special mortars fast drying (type "Topcem Pronto" Mapei)
Any cracks due to drying shrinkage of the support will have to be sealed by using of bi-component fluid epoxy adhesive (type "Eporip" Mapei).
To reduce the risk of cracking in fresh basement, as soon as it has reached a consistency that does not cause the breaching of aggregates, it must be made of splitting joints for every about 20-25 m^2, in order to locally weaken the basement and concentrate any withdrawals, reducing the risk of formation of cracks distributed over the surface. These joints must then be respected during the steps of laying.
When seasoned, the basement must present suitable mechanical resistance to the stresses to which the flooring will be subjected in operating conditions. In the case of residential floors are considered sufficient resistances of about 15MPa. In case of industrial or commercial floorings is considered that the compression strength of the basement must be ≥ 30 MPa.

DISCONNECTED SCREEDS

If it involves the construction of a disconnected screed is necessary to interpose between the substrate and the support (for example the finishing vault in reinforced concrete) a horizontal separating layer (for example a layer of polythene or PVC) and positioning along the perimeter of the walls around the pillars, a layer of compressible material, such as expanded polystyrene type, 1cm thick. The sheets of sliding layer must be folded up to about 10 cm on the pillars and walls, overlapping them by at least 20cm and then taped. The thickness of this type of basement must be, in case of pedestrian traffic, not less than 35mm.
The disconnected screed (freed from the support), must have a minimum thickness of 4cm when installed in residential use with light traffic that may need to be increased with rising expected stress laid in operating conditions.
In cases where it needs to obtain a greater resistance to cracking and a better distribution of loads, insert in the centre line of the concrete slab during casting a electro-welded (galvanized wire mesh net).
The thickness should always be greater than 4cm if the basement is carried out on compressible layers, such as insulating materials. The increase of the thickness must be considered on the basis of the thickness and compressibility of the insulating layer. In this case it must always be provided for the insertion of an electro-welded mesh in the centre line of the basement.



EXISTING FLOORING IN CERAMIC OR STONE MATERIAL

Generally the existing flooring of ceramic or stony material must be adequately cleaned by using a solution of hot water and caustic soda at 20%, and adequately rinsed with clean water to remove any traces of detaching substances. In some special cases it is possible to proceed to the superficial surface abrasion of the surface in order to create a rough and clean surface that favours following adhesions.
Such a preparation is required both before laying of the tiles and in the case of preventive application of levelling layers.
In the case of ceramic tiles and stony material, you must also ensure that the existing coating is perfectly bonded to the substrate, flat and free of cracks or portions which are detaching or flaking. Otherwise it is necessary to:

- Remove all damaged tiles or those ones that ring empty;
- Seal any cracks on the substrate through the use of fluid two-component epoxy resins (type "EPORIP" of Mapei);
- Fill the gaps created by removing the tiles or non-adherent plates, using levelling compounds, quick-hardening, thixotropic (type "PLANITOP FAST 330", ADESILEX P4" or "NIVORAPID" of Mapei);
- Fix any imperfections using flatness levelling mortars after adequate cleaning of the existing surface and eventual use of a suitable primer (MAPEI type "ECO PRIM GRIP" or "ECO prim t").
- To obtain a particularly regular laying plans you can use self-leveling (as ULTRAPLAN or ULTRAPLAN MAXI of Mapei).

PLASTER

It is recommended to choose the right size used according to the characteristics of the support on which to lay the Stoneglass®2.0 and according to the ability of the installers.
The supports on which to lay the Stoneglass®2.0, besides being suitable to withstand the expected stress, must be a plane surface, cleaned, seasoned and in any case adequate and suitable to act as a base for gluing with the bonding agent depending on the technical specifications of the same adhesive.
Before laying the substrates made of cement plaster must have the following characteristics:
• Seasoned (7-10 days per cm of thickness)
• Planar (level difference <± 2 mm, checked with a straight edge of 2 m)
• to have the adequate mechanical strength and well adherent to the substrate. The verification of this feature can be done by typing or by using specific tear tests.
• Dimensionally stable and therefore free from shrinkage and cracking problems
• Clean and devoid of any substance likely to affect following adhesions.
If the surfaces present surface dusting, it is recommended to apply a coat of the "Primer g" or "Ecoprim t" (of Mapei).

LAYING THE TILES IN INTERNAL

It is recommended to choose the format used according to the characteristics of the substrate on which to lay the Stoneglass®2.0 andaccording to the ability of the installers.
The following instructions and recommendations are appropriate:
Before proceeding with the laying of tiles Stoneglass®2.0 you must choose the most suitable adhesive depending on the type of support on which the installation is done, the target environment, the environmental conditions of the site and the time available between the laying and going into service or use.
For the laying of slabs Stoneglass®2.0 is usually recommended to use Elastorapid of Mapei. In the case of special supports, such as metal substrates or non-absorbent, you must use reactive adhesives based on resins such as Ultrabond Eco Pu 2k of Mapei.
Carry out the appropriate verifications of the support described in the previous paragraphs, apply the tiles so that the adhesion is perfect and has a uniform flatness.
In this purpose it is considered necessary to apply pressure to the tiles to facilitate the proper distribution of the adhesive.
Laying and grout must always be done with large space joint and, depending on the size of the tiles, the type of support and the operating conditions.

COMMISSIONING

Mix the adhesive and apply it on the substrate using a trowel whose teeth will be chosen depending on the size of the covering to be laid. The choice must be made so as to ensure total wetting of the back of the tiles. The tiles should be applied onto fresh within its open time, making sure that it has not formed a superficial skin; in that case it will have to be laid out a new fresh adhesive layer.
In the case of installation in public places with commercial destination, subject to heavy traffic, it may be necessary to proceed with the installation by the technique of double coating, or by applying the adhesive on the support and on the back of the slabs, so as to ensure a almost total wetting of the back of the slabs and minimize the risk of the presence of gaps on the back of the tiles.
Exerting a good pressure on the tiles to ensure adhesive transfer and make the necessary adjustments before the product comes into the grip.
Create every approximately 20-25 m² of the splitting joints, obviously respecting the joints that may be present on the support.

Stoneglass®2.0 does not require pretreatment for laying

PLASTERING AND SEALING OF THE GROUT AND JOINTS

After hardening of the glue you can proceed with the plastering and sealing of floor joints.
You can proceed to plaster the joints using a two-component epoxy mortar as Kerapoxy CQ o Kerapoxy Design of Mapei. The sealing of splitting joints must be made with flexible sealant such as E-Mapesil LM of Mapei.

For further information, please view the video at the following link:

https://youtu.be/9UHZiE41mIQ laiyng tiles

PREPARATION OF NEW SUBSTRATES

If the substrate has still to be realized it is recommended to realize a suitable waterproofing.
The screed in exterior must have a minimum thickness of 6 cm and a compression strength of at least 30 MPa. The minimum thickness, however, must be evaluated in accordance with the final destination and the expected loads. To reach this strength value it is possible to use TOPCEM or TOPCEM PRONTO of Mapei. TOPCEM PRONTO is a pre-mixed mortar classified CT-C30-F6-A1fl in accordance with European standard EN 13813; these products, used in compliance with their Technical Data Sheet, guarantee final performances (after 28 days) of 30 MPa of compression strength and 6 MPa of flexural strength. The premixed mortar TOPCEM PRONTO is also certified EC1 R Plus according to the GEV Emicode and can therefore be used for the production of screeds with very low emission of volatile organic substances.
As soon as the screed reaches a sufficient compactness (usually after 24 hours for normal grip screeds) it is necessary to create control joints every 15 m2 by cutting the screed for a third of the thickness. If the screed has been made with special binders with plywood backing (such as TOPCEM, TOPCEM PRONTO, MAPECEM or MAPECEM PRONTO of Mapei S.p.A.) these surfaces can be expanded. In the case of screeds made in adherence to the support, the screed joints must respect the pre-existing ones. When laying on a traditional screed, the laying of Stoneglass®2.0 slabs is possible after about 7-10 days for every centimeter of thickness. The use of quick or fast drying screeds allows to reduce the waiting time: laying is possible after 4 days if you use TOPCEM or TOPCEM PRONTO and after only 24 hours if you use MAPECEM or MAPECEM PRONTO (classified CT-C60-F10-A1fl in accordance with EN 13813).

PREPARATION OF EXISTING SUBSTRATES

When the laying of Stoneglass®2.0 tiles has to be realized onto existing substrates, it is necessary to verify its characteristics like compressive strength, flatness, cleanness, absence of cracks and of any kind of material that can compromise the adhesion of the materials that have to be used for the installation. After an accurate clearing of the substrate, all the cracks present on the surface must be monolithically sealed using a two-component epoxy adhesive such as EPORIP of Mapei. The irregularities or depressions present in the support must be filled with a suitable mortar, applying beforehand an adhesion grout made of water, cement and latex (such as PLANICRETE Mapei) or epoxy resin (such as EPORIP Mapei). For quick repairs, it is advisable to use a quick-setting mortar, such as MAPECEM PRONTO Mapei, por thicknesses of more than 1 cm. A quick mortar such as PLANITOP FAST 330 from Mapei can be used when the thicknesses to be achieved are between 3 and 30 mm. The same product can also be used if it is necessary to create a ramp or a connection between rooms at different altitudes. Whenever the irregularities of the support are greater than 3 mm, measured under a 2m layer, it is always necessary to apply a shaving product to regularize the laying surface.

LAYING OF SLABS

After an accurate preparation of the substrate it is possible to proceed with the installation of Stoneglass®2.0 slabs.

CHOICE OF ADHESIVE

● Slabs up to 60cm x 60cm

Stoneglass®2.0 slabs can be laid using a normal setting, deformable, improved cementitious adhesive such as KERAFLEX MAXI S1 Mape, classified C2TES1P1 in accordance with EN 12004. This adhesive is also certified EC1 R Plus according to the GEV Emicode, therefore allows you to make the laying with a product with very low emission of VOC (volatile organic compounds). The laid flooring will be ready for light foot traffic after 24 hours and for the final use after 14 days.
If a shorter installation time is required an improved, deformable, quick-setting cementitious adhesive, such as GRANIRAPID from Mapei, classified C2FS1 according to EN 12004, can be used. This adhesive is also EC1 R Plus certified according to the GEV Emicode, with very low emission of volatile organic substances. The coating laid with this adhesive can be opened to light traffic after 3-4 hours and is ready for commissioning after only 1 day after installation.

● Slabs larger than 60cm x 60cm

For the laying of large slabs it is advisable to proceed to the laying by using an fast improved adhesive, with two components, highly deformable, with elongated open time, such as ELASTORAPID by Mapei, classified C2TFES2 in accordance with EN 12004.
In case it is not necessary to use a quick-setting product, it is possible to use an improved performance adhesive, highly deformable, with extended open time, such as Mapei's ULTRALITE S2, classified as C2ES2 according to EN 12004. This product is one-component, lightweight, characterized by a very high yield, excellent ease of application and high wetting capacity of the back of the slabs.
The slabs must be laid respecting the joints present in the support. In addition, since it is installed outdoors, it is necessary to create partitioning joints that involve only the thickness of the coating. The fields to be realized for this type of joints must be calculated in all directions taking into account the exposure to the sun rays of the surface, and therefore the maximum temperature range to which the coating can be subjected, as well as the coefficient of thermal expansion of the material (which is strongly influenced by the color of the coating itself), according to the following formula:
$L = L_1 * \square * \square T$
(Dimension of the joint = length of the area side*coeff. of thermal expansion*max. variation of temperature).

CHOICE OF SEALANT FOR JOINTS

Given the expected time for grouting the joints (indicated in the data sheet Technique of the adhesive used for laying) it is possible to proceed with the grouting of the coating of Stoneglass®2.0 slabs using a high-performance grout, such as ULTRACOLOR PLUS by Mapei, classified as CG2 according to EN 13888. This product, when applied correctly, allows a quick grip, low water absorption, excellent color tightness and minimizes the risk of the formation of efflorescence or mold on the surface of the joints.

CHOICE OF ELASTIC SEALANT FOR JOINTS

The joints made in the support that are respected in the laying of the coating must be sealed with an elastic sealant, such as MAPESIL LM by Mapei, neutral cross-linking silicone. The same product should also be used for sealing the fractionation joints in the coating.
For the correct sizing of the joints and to prevent the sealant from sticking to the bottom of the joint (thus reducing its deformation capacity), it is necessary to introduce inside the joint a cord of polyethylene foam as MAPEFOAM by Mapei. After the positioning of the cord, which must be pressed into the depth of the joint made in the support, it is possible to proceed with the extrusion of the sealant to complete the sealing of the joint.

PREPARATION OF SUBSTRATES

The installation onto external walls can contemplate different kinds of substrates.

CONCRETE

Laying on concrete walls can only be carried out after maturing. The curing time varies depending on the concrete design mix, thickness, environmental conditions, etc.
The support must have high mechanical strengths and must not present problems of shrinkage or cracking.
The surface must be thoroughly cleaned of any dirt, disarming oils or any other substance that may compromise the adhesion of the slabs.
If spacers are found on the surface, they must be cut to a depth of at least 2 cm, apply a protective mortar such as MAPEFER or MAPEFER 1K by Mapei, then restore the removed concrete using a thixotropic cement mortar such as PLANITOP RASA E RIPARA or MAPEGROUT 430 by Mapei.
Both of these products can also be used to carry out repairs on old concrete structures before laying the slabs.
Any cracks must be enlarged, cleaned and sealed using a thixotropic epoxy adhesive such as ADESILEX PG1 Mapei.
Unevenness of the surface or any out of the lead can be regularized using NIVOPLAN Mapei, additive with PLANICRETE to improve adhesion to the surface and final performance.

CEMENTITIOUS RENDER

If the installation is to be carried out on a plaster is necessary to verify it is solid, smooth, resistant, clean, free from flaking elements or other substances that can inhibit the adhesion. Old paintings or adhesive have to be completely removed. It's always recommended to carry on pull-out test to verify the adhesion of the plaster onto the substrate: usually the minimum required value is 1 N/mm^2.
When a new plaster has to be realized it is necessary to use a cement based mortar with an high adhesion to the substrate (>1 N/mm^2) and good flexural strength (8 N/mm^2).
A plaster that satisfy this requirements can be realized adding to the normal mortar a special latex like PLANICRETE Mapei, diluted 1:4 with water, or using a special leveling mortar such as NIVOPLAN Mapei, mixed with the same PLANICRETE (2 kg each bag of NIVOPLAN) and water.
The installation of tiles can be carried out when the plaster is completely cured and has completed all its possible shrinkage, after at least 7-10 days each cm of thickness.

OTHER SUBSTRATES

All the different kinds of substrates have to be well cleaned, solid and resistant. If the existent substrate is dusty it will be necessary to realize a new reinforced plaster, directly fixed to the structure. Old paintings or adhesives have to be completely removed.

LAYING OF SLABS

After an accurate preparation of the substrate it is possible to proceed with the installation of Stoneglass®2.0 slabs.

CHOICE OF ADHESIVE

For external application on walls usually it is suggested a high deformable adhesive, due to the high possible solicitation of the covering.
Stoneglass®2.0 slabs can be laid using an improved normal-grip, highly deformable cement adhesive, such as KERABOND Mapei, mixed with ISOLASTIC in complete water replacement, in order to reach class C2ES2 in accordance with UNI EN 12004.

If a shorter installation time is required, ELASTORAPID Mapei can be used. ELASTORAPID is a fast improved cementitious adhesive, highly deformable, open-time elongated, classified as C2TFES2 according to UNI EN 12004.

Moreover it will be necessary to realize expansion joints. The jointed area dimension must be calculated in all the directions taking into consideration the direct sunlight exposure of the surfaces, and therefore the maximum thermal excursion expected, and the coefficient of thermal expansion of the material:
$L = L1 * \alpha * \Delta$
Expansion joints must always be realized in correspondence of corners, edges, string courses, doors and windows.

CHOICE OF GROUTING

After the necessary time for grouting it is possible to grout Stoneglass®2.0 slabs using a high performance grout such as ULTRACOLOR PLUS Mapei, classified CG2 in accordance to UNI EN 13888. This product, if correctly applied, ensure a fast setting, low water absorption and avoid the formation of efflorescence and molds. It is also EC1 Plus certified according to GEV Emicode, with very low emissions of volatile organic substances.

CHOICE OF SEALANT

The joints present in the support and the deformation joints previously prepared must be respected in the final coatings and sealed with an elastic sealant such as MAPESIL LM Mapei, neutral cross-linking silicone.
To allow a correct sizing of the joints and prevent the sealant from sticking to the bottom of the joint, limiting its deformability, it is necessary to insert MAPEFOAM Mapei, a closed-cell expanded polyethylene cord. After positioning MAPEFOAM, the joint can be sealed with the chosen product.

NOTES