

LightKer Technical Guide

SILCERAMICHE

SASSUOLO ~ ITALY



The ceramic slabs become the skin for volumes, multiplying the applications and the usage destinations. Starting from this idea LightKer is a new concept of surface, creating an aesthetically advanced product, with unique technical performances. Realized with advanced technologies the thin thickness is combined with a high resistance to mechanical solicitations , to chemical products , to usage, to scratches , to deep abrasion, easy to hygienize, frost , fire, molds and U.V rays resistant. All the chromatic characteristics of the slabs will remain the same in the years without any change due to atmospherical conditions.



The thin thickness and the high technical performances allow Lighker to be easily used in restructuring projects : the slabs can be used for wall tiles and floor tiles overlaying them to all kind of material without having to remove them reducing the cost and time necessary for the project.

LIGHTKER

Serie: **SHADES**
(plain colors)

Thickness: 3,5 mm (with fiber glass)

Sizes in mm:

1000x1000

500x1000

1000x3000

Colors:

Snow

Ivory

Pearl

Smoke

Black

Bran

Dove

Serie: **MORE**
(cement effect)

Thickness: 5 mm

Sizes in mm:

1000x1000

500x1500

1000x3000

Colors:

Ice

Grey

Warm grey

Beige

Dark

Rust

Burned

Serie: **WOODSTRIPES**
(wood effect)

Thickness: 5 mm

Sizes in mm:

1000x1000

500x1500

1000x3000

Colors:

Cool (grey)

Warm (beige)

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PACKAGING DETAILS

3+ slabs with fiberglass on the back - SHADES

- The size 1000x3000 will be packed in a wooden crate 1150 mm large x 3200 mm long x 260 mm high
20 slabs = 60 mq per wooden crate
- The size 500x1000 will be packed on a pallet 110x110x60(height)cm
32 boxes ; each box contains 2,5 mq ; therefore 80 mq per pallet
- The size 1000x1000 will be packed on a in un pallet 110x110x70(height)cm
25 boxes ; each box contains 3 mq ; therefore 75 mq per pallet

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PACKAGING DETAILS

5 - MORE – WOODSTRIPES – B-STONE- BRECCIA

***size 1000x3000x5 :**

Wooden FAO crate
13 slabs per box/39 mq
1 slab / 3 mq

***size 1000x1000x5:**

Wooden FAO pallet
25 boxes per pallet/50 mq
2 pcs per box /2 mq

***size 500x1500x5 :**

Wooden FAO pallet
48 boxes per pallet/72 mq
2 pcs per box /1,5 mq



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APPLICATIONS:

- Floors
- Indoor walls
- Outdoor walls facade
- Interior design furniture covering (covering of kitchen and bathroom top, wardrobe doors, tables....)

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Crates handling



To lift and move the crates of slabs 1000x3000 mm or 500x1500 mm, using fork lifts or yard cranes, it is important to get the package in the long side, caring to position the forks in its centre and extending them as much as possible as they have to grip all through the crate depth.



If the crate is lifted from the short side, this may happen in loading and unloading a container, 2,5 mt forks long shall be used for a correct and safe product handling

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Slabs handling



Move the slab always with 2 operators keeping it always perpendicular to the ground, without bending and protecting the corners from accidental impacts.



Lay the slab gently on the long side, keeping it slightly sloped and caring to arrange it on soft material or suitably spaced wooden strips.

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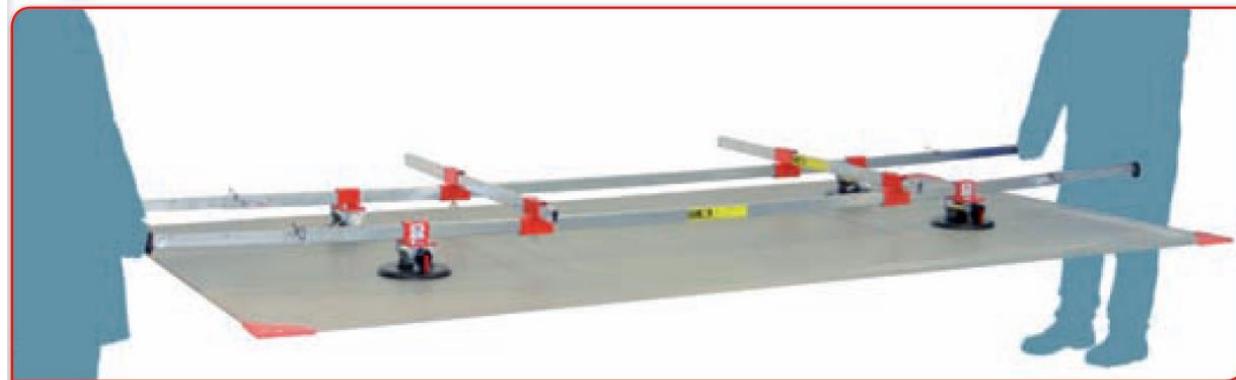
SUPERSTICK • Art. 300-70

Sistema di movimentazione grandi formati - Kit completo

Handling system of large tiles - Full kit



PORTATA
Kg
80
MAX LOAD



MONTOLIT

GOAL • Art. 300-85

Carrello per il trasporto dei grandi formati
Bogie for the transport of large tiles



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FREE-MOVE - SISTEMA PER LA MOVIMENTAZIONE DI LASTRE 300x150 cm
FREE-MOVE - SYSTEM FOR HANDLING BIG/TILES SLABS UP TO 10'x5'



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Slabs operations : drilling and cutting

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Drilling



The slabs can be easily dry or water drilled by diamond tools suitable for porcelain stoneware and glass processing. Drilling must be done from front of the slab to the rear.

Before any operation make sure that the operating surface is clean and perfectly flat, for this purpose the cover of the crates for the slab 1000x3000mm can be used.

The circular cutters/cups and diamond disks to be used on electric sanders must be with continuous band and in good conditions.



For holes having a 8-10mm max diameter , use diamond or tungsten bits for glass or porcelaine stoneware mounted on electric drills. Do not hammer-drill and start with a slow rotation speed. Do not press too much on the surface. It is recommended to cool the tool and drilling point with water.

To make openings inside the slabs or L-shaped cuts, use electric sanders with diamond disks with continuous band, with fast rotation speed and low advancing speed.

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Diamond disks



Diamond tools and cups



Diamond driller



Diamond pads



Diamond tools for borders and 45° cuts



Cutting

The slabs can be cut using

Glass cutters , manual tile cutters, electric disk cutters and manual sanders.

For making special cuts or shapes, use water-jet systems or cutting benches generally used by marble or glass workers.

The cut of Lightker 3+ by manual cutter must be finished by etching the blanket with a standard cutter.

Cutting and drilling must be made from the front to the back of the slab.



With a glass cutter (like Bohle Silberschnitt 2000) etch the slab surface from the outside edge to the outside edge , without never detaching the blade from the etching axis and keeping it perpendicular to the surface. Do not interrupt nor restart cutting and press steadily and evenly.



Chop off the etched surface at the edges to aid the cut fracturing. For dimensions larger than 1000mm open the cut by shearing from both etched edges.

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Cutting

The slabs can be cut using glass-cutters, manual tile cutter, electric disk cutters and manual sanders. For making special cuts or shapes, use water-jet systems or cutting benches generally used by marble or glass workers.



For cuts on the long side of Lightker 1000x3000mm position the slab on a stable and flat plane and fasten a standard aluminum rod on the surface to be etched. Cut and shear as described before, then take the slab with open arms on the long side and, starting from the already opened edges, slightly press downwards till shearing completely.



For a correct finishing and to avoid sharp edges it is important to use diamond sponges or pads.

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Cutting tools for 1000x3000 mm slabs

There are also manual tools for cutting the 1000x3000 mm slabs



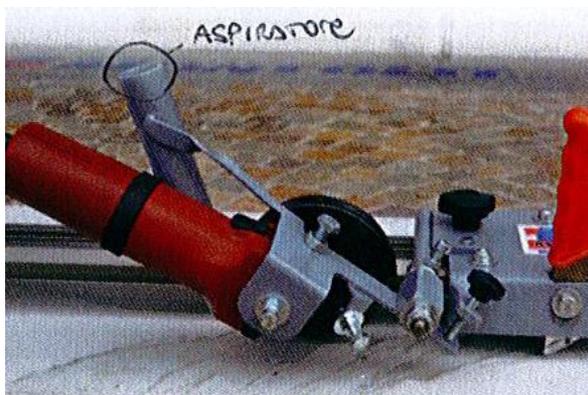
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MONTOLIT



fissaggio con ventose
fixation with suction cups



incisione di piastrella
posta a terra



engraving of tile
placed on the ground



spacco
iniziale



initial
splitting



spacco finale



final splitting

SIGMA ITALIA

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Floor application/

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The LightKer slabs are suitable to be applied on any type of building screed with the proper installation features, note that a correct product installation largely depends on the screed conditions.

Whatever the substrate is, before application check the latter has the following features:

- Is completely clean without grease, oils or dust;
- Is dry without cement residues, paints and loose or not completely bonded parts. In such conditions it is basic to clean and remove the residues;
- Is perfectly compact and resistant;
- Is flat; flatness is checked by a 2 m long rod laid on the screed in all directions; the maximum allowed tolerance is 3mm. It is also basic to smooth flatness differences by using suitable self levelling products;
- Is solid, without cracks and has finished the usual hygrometric shrinkage. In case of slightly cracked or non solid screeds, it is recommended to use a crack preventing mat between substrate and slab;
- Has a suitable hardness and mechanical resistance to stresses due to final uses;
- Is sufficiently thick;
- Has been prepared using perimeter bands and expansion joints as necessary.



Traditional cementitious screeds

They have to be cured, compact and homogeneous throughout their thickness (at least 4 cm.) Usually, 7-10 curing days are necessary for every screed thickness cm . This indication has to be checked and given by the Work management.

Concrete substrates

They have to be cured at least 3 months. They must not show crust, irregular surface, strippers, old adhesives, anti-evaporating treatments or other substances that could jeopardize the slab bonding. The substrate shall have structural and sectioning joints depending on the surface type and dimensions. It is also basic that slabs are insulated against any rising damp.



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Anhydrite screeds

Must be sand papered. De-dusted and dried and have an allowed humidity content lower or equal to 0,5%.

Screeds in heating floors

Besides what mentioned in the general instructions it is fundamental to check that the heating system has been switched on respecting the screed curing times according to the used material. Also make sure that the thermal shock has been performed, according to the norm UNI EN 1264-4 turning on the heating with temperature between 20° and 25° for at least 3 days then the temperature has to be increased 2° every day until you reach the highest temperature to be kept for 4 days. After this thermal shock it is basic to fill the cracks due to the process . Lay the lightker only when the screeds is back to normal temperature.



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Overlay on existing floors

After all the checking indicated in the general instructions , before the application , clean the substrate with a solution of water and sodium hydroxide, then rinse carefully. If a chemical cleaning cannot be made, a mechanical abrasion is recommended, this has to be done in any case for polished floors , marble, pvc and wood .

If it is not possible to respect the dilatation joints of the existing floor place an anti-fracture membrane between the substrate and the slab



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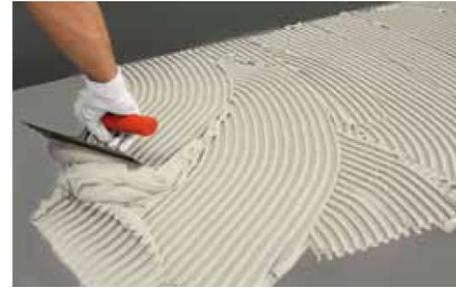
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Floor application steps/

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Check the flatness of the screed or of the existing floor. Flatness differences can be smoothed by self-levelling products. The choice of the squeegee to be used depends on the finishing and flatness of the substrate and is directly proportional to the slab dimensions. Generally for a slab 1000x3000 mm, is recommended to use a squeegee with 6mm sloped teeth for the substrate and a squeegee with a 3mm sloped teeth for the slab back side

Apply the adhesive with the back-buttering method in full bed, first on the slab back side and then on the substrate, caring to cover corners and edges, too, and avoid air gaps between substrate and slab. Apply the adhesive gradually only on the surface involved in the application of a slab, to avoid surface film that could jeopardize bonding.



Lay the slab carefully on the long side and, keeping it slightly sloped, lower and apply it and make adhere on the substrate. Fit the spacers to create the wished joint : it is recommended to use suckers to aid the exact slab positioning.

Beat on the surface using a rubber coated squeegee caring to eliminate gaps and qair bubbles. Always check the perfect adhesion of corners and edges. Do not walk on the floor during and after application, respecting the trampling time indicated by the adhesive manufacturer.

JOINTS

A minimum joint of 2 mm. is recommended for indoor applications, to be evaluated depending on the dimensions of the slab and of the area and on possible heating floors.

For outdoor applications a min. joint of 5 mm is recommended.; it shall be defined according to the size, to the thermal shocks and to the slab color.

Outdoor it is important to check if the screed is free from any rising damp. It is basic to choose the materials to be used depending on the width and finishing that the joints must have.

Before grouting the joints it is recommended to respect the time indicated by the adhesive manufacturer : epoxy resin or cement based products can be used. The latter ensure a better evenness and color fastness in time.

EXPANSION JOINTS

During the application it is strictly necessary to respect all structural expansion joints in the substrate. In case of much extended surfaces, create fractioning joints of about 8/10 mm dividing the area as follows:

- On highly trampled surfaces and on substrates subject to movements and bending, outdoor it is necessary to arrange squares of about 9-12 sq.mts. (longerside anyway not exceeding 4mt.)
- On indoor solid surfaces it is possible to arrange joints about every 25-25 sq.mt.
- Create perimeter joints applying Lightker at about 5-7 mm da from columns, walls, edges and corners, caring not to fill this gap while grouting the joints. Fill the expansion joints using profiles or specific products. The dimensions and spacing of the joints will be decided by thw Work management.

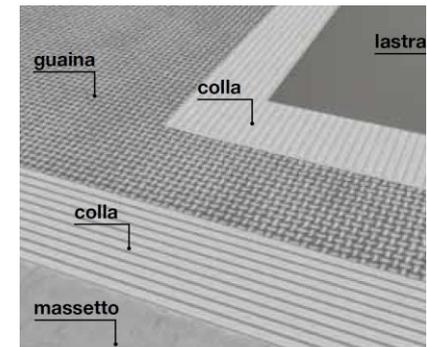


INTERMEDIATE SHEATHS/BLANKETS BETWEEN SCREED AND SLAB

The use of sheaths or blankets between screed and slab enables :

- to intercept possible rising damp from the screed by using water-proofing products or insulating sheaths;
 - to apply on screeds not perfectly cured, heated, with non levelled shrinkage (splits) or non solid screeds, using anti fracture blankets to be positioned between screed and slab;
 - to improve the trampling sound insulation of floors, placing sound-deadening blankets between screed and slab;
 - to create new fractioning joints: if it is not possible to respect the fractioning joints in the screed or in the existing floor to be coated, place an anti-fracture membrane between substrate and slab.
- The application is made by bonding the membranes on the substrate, then proceeding with the slab application as usual.

Structural joints must be respected and new fractioning joints on the new coating must be arranged.



Wall application /

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APPLICATION ON OUTDOOR FACADE

Lightker can be applied on outdoor walls in concrete or cementitious render. In case of mixed substrates with reinforced concrete frame and brick curtains it is necessary to dress the wall before the application, reinforcing the render with suitable mesh at least close to the material change. The render shall be suited to receive a ceramic coating, thus it must be made with a cementitious grout ensuring high mechanical resistance to flexure and high bonding on walls (bonding to substrate about 10kg/cm²).

The substrate must be flat, without cracks and solid and must have completed the usual hygrometric shrinkage. Flatness differences must be previously smoothed by suitable levelling products. Cracks or splits must be de-dusted and sealed with suitable materials.

Before the application, make sure the substrate is dry, without dust, grease, oils and loose or not completely bond parts (concrete, paints, lime) that shall be properly removed

Choice of sizes, joints and clearance

The application in outdoor facades is subject to strong thermal expansions : when choosing the slab size, it is recommended to evaluate the sun exposure, the geographical position and the slab color (dark colors and black in particular attract heat more, with a following higher thermal expansion).

The choice of the size to be used in the facade shall be evaluated to enable the operator a correct installation (handling, back buttering, bonding and beating) depending on the height of the wall and of the site equipment (scaffolds, cranes, lifts). Generally it is recommended to reduce the size as height increases. Respect the norms in force in relevant country. The application must be made with wide joint : generally , a 5-10 mm joint is recommended , to be defined according to the weather conditions and slab dimensions.

Respect the structural joints and arrange fractioning joints close to the string-course bands, corners and edges and every 9-12 sqm. with longer side not over 4m. Joints must be sealed with suitable materials available on the market.

APPLICATION ON INDOOR WALLS

The substrate must be flat, without cracks and solid and must have finished the usual hygrometric shrinkage. Flatness differences must be previously smoothed by suitable levelling products.

Cracks or splits must be de-dusted and sealed with suitable materials. Lightker can also be installed on existing wall coatings: before the application, make sure existing coating is solid, stable, anchored on the wall and without loose parts.

Before the application, clean the existing wall coating with a solution of water and sodium hydroxide, then rinse carefully. If a chemical cleaning cannot be made, a mechanical abrasion is recommended.

Depending on the substrate to be coated, it may be necessary to use a primer to improve bonding on the substrate, as possibly recommended by the manufacturer of the used adhesive.

CHOICE OF SIZES, JOINTS AND CLEARANCE

The choice of the size and of the type shall be made also according to the handling and logistics possible on the site. Joints of min. 1mm are recommended, depending on the size of the slab and on the dimensions of the wall to be coated.

Before grouting the joints respect the time indicated by the adhesive manufacturer: epoxy resin or cement based products can be used. The latter ensure a better evenness and color fastness in time.

Respect the structural joints arrange fractioning joints close to the string-course bands, corners and edges and approximately every 20-25 sqm. of surface.

Joints must be sealed with suitable materials available on the market.

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ADHESIVE AND APPLICATION

It is important to use a deformable or highly deformable adhesive able to suit the coating natural expansion movement, thus balancing the tensions generated on the substrate. On crumbled or very absorbing renders it may be necessary to use a professional water-based concentrated insulating product (PRIMER), according to the indications given by the chosen adhesive manufacturer.

Apply the adhesive in full bed with back-buttering both on the substrate and on the slab, caring to cover corners and edges, too. The quantity of used adhesive must be directly proportional to the slab dimensions and to the substrate features. The operator shall choose the squeegees to be used: generally smooth or 3 mm toothed squeegees are to be used on the slab and 6-9mm sloped toothed squeegees are to be used on the substrate.

It is very important that the quantity of adhesive ensures an application without air gaps between slab and substrate.

Apply the adhesive gradually only on the surface involved in the application of a slab, to avoid surface film that could jeopardize bonding.



PROFILES

To complete and finish the installation, profiles for corners, terminals, decorating bands, edges, expansion joints and perimeter edges are available on the market from several manufacturers suitable both for Lightker 3+ and Lightker 5.





The Lightker slabs can be cleaned very easily. Anyway , few measures are recommended to obtain the best results. Preventive tests must be made on a small part of the material with the proper product , so as to check that it will not damage the surface.

Cleaning after the application

After application and the joint filling are completed , the ceramic surface must be cleaned to remove all possible contaminating agents (cement or grout residues, etc.) It is basic to carry out this operation correctly otherwise there could be problems in the daily cleaning.

For a correct cleaning, always follow the specific indications by the manufacturers of grouts and adhesives used in the application as for waiting times, products to be used and procedures.

In case of large surfaces, it is recommended to use single brushes with soft disks. If the temperature of the slabs is high do not do the after application cleaning and wait the fresher hours of the day.

Cementitious products

Residues of concrete, slurry, lime and cementitious grouts can be removed using detergents based on buffered acids according to the times and methods indicated by their relevant manufacturers. These products must be used carefully following the instructions.

Products for cleaning cementitious products residues:

FILA / Deterdek
LITOKOL / Litoclean Plus
ADESITAL / Adesit Clean
KERAKOLL/ Delta plus Eco
TECHNOKOLLA / Det – Acido
FABERCHIMICA / Cement Remover

Epoxy products

It is necessary to eliminate epoxy grout residues immediately after the application, using a sponge and plenty of clean water. Then clean more thoroughly with alkaline detergents, caring to follow the instructions on the labels of the used products. To improve the effect of the cleaning we suggest to dry the surface with absorbing paper right after the cleaning in order to avoid that resin stays on the surfaces once the water is evaporated.

Products for cleaning epoxy products residues:

MAPEI / Kerapoxy Cleaner
FILA / FilaCR10
LITOKOL / Litonet- Litonet Gel New Formula
ADESITAL / Kerapoxy Cleaner
LATICRETE / Epoxy Remover
KERAKOLL/ Fuga-Soap Eco (pulizia di Fugalite Eco)
TECHNOKOLLA / Epoxy Det
FABERCHIMICA / Alkaline Cleaner – Wax Remover

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The following table summarizes a few cleaning instructions for different stain types .

Staining agent (24h)	Cleaning method
Green staining agent, Vaseline grease, olive oil, Coffee, tea, tomato, balsamic vinegar, coke, red wine, shoe polish, iodine, methylene blue	Cleaning with hot running water
Sludge-type grease, potassium permanganate	Cleaning with abrasive detergents
Dark nail enamel	Cleaning with nail solvent
Indelible marker	Cleaning with solvent (nitro thinner)

A preliminary test on a hidden part of the material is always recommended

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Light**Ker**
TECHNICAL
GUIDE

THE PRODUCT

PACKING AND PACKAGES

HANDLING

Palletized package handling by fork lifts

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JOINTS

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WALL APPLICATION

Application on outdoor facade

Application on indoor walls

Adhesive and application

CLEANING AND MAINTENANCE

Cleaning after the application

Cementitious products

Epoxy products

Routine cleaning

Extraordinary cleaning

Slabs are made in porcelain stoneware and produced with an innovative technology, by compacting the material and then firing it in an electric kiln at temperatures over approx. 1220°C, suitably designed to ensure the product evenness.

The slabs manufactured in this way are perfectly flat and can later be cut or trimmed with total size accuracy.

THE PRODUCT LIGHTKER is available in two types, each one suitable for the following final uses:

LIGHTKER 3+ FEATURES

Basic slab reinforced by a fiberglass blanket applied on the back side.

Nominal thickness: 3 mm

Weight: 8,2 kg/sqm

FINAL USE

Building sector

- tiling of indoor and outdoor floors on screeds or existing floors by bonding in places not subject to heavy traffic
- outdoor/indoor wall tiling by bonding
- ventilated walls
- Furnishing and interior design.

LIGHTKER 5 FEATURES

Basic slab

Nominal thickness: 5 mm

Weight: 12 kg/sqm

Building sector

- tiling of indoor and outdoor floors on screeds or existing floors by bonding in places not subject to heavy traffic
- outdoor/indoor wall tiling by bonding
- ventilated walls
- Furnishing and interior design.



LIGHTKER , in sizes larger than 1000x1000 mm, are carefully packaged on wooden crates that can be overlapped, suitably designed for a damage-free delivery. The size, volume and cost, when transporting Full Size slabs, are optimal when using TWIN BED (a doublecrate that is stackable). This packaging has been purposefully studied for overseas shipments of FULL SIZE slabs. In size 1000x1000 and sub-multiples, LIGHTKER is packaged in cardboard sheets placed on suitable pallets that can be overlapped.

Palletized package handling by fork lifts LIGHTKER, in the size 1000x3000mm, can be easily lifted and vertically positioned by a single operator and can be handled by two operators.

To handle 1000x1000 mm slabs or sub-sizes a single operator is sufficient. Always work keeping a correct posture, avoiding excessive stresses in the lumbar area; wear suitable gloves for a better grip and to avoid abrasions.



To lift and move crates of slabs 1000x3000 mm, using fork lifts or yard cranes, it is important to get the package in the long side, caring to position in its center, extending the forks as much as possible as they have to grip all through the pallet.



If the pallet is lifted from the short side, as it could happen while unloading from a container, min. 2.5-m long forks shall be used for a correct product handling..



Position the package close to the surface to be coated. Lift the slab from the long side till positioning it vertically.

Manual handling and storage



Handle the slab with the aid of a second operator, keeping it always perpendicular to the ground, without bending and protecting corners against accidental impacts.



Lay the slab gently on the long side, keeping it slightly sloped and caring to arrange it on soft material or suitably spaced wooden strips.



Overlap several slabs horizontally, making sure the surfaces are clean and the supporting plane is perfectly flat.
Up to max. 30 Lightker 3+ slabs can be overlapped.



To aid handling of 1000x3000 mm slabs, above all to handle a slab weakened by drills or openings and to aid the wall application, a suitable frame with suckers. This frame is available upon request and is shown in the price list. Always check the perfect adhesion of the suckers on the slabs before handling it.

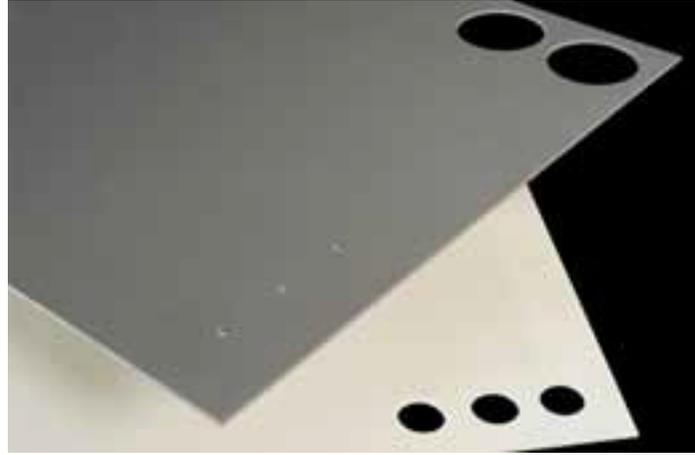
Drilling

LIGHTKER can be easily dry or water drilled by diamond tools suitable for porcelain stoneware and glass processing. Before any operation, arrange a clean and flat processing plane. For this purpose, the cover of the crates for the slab 1000x3000 mm can be used.

The circular cutters/cups and diamond disks to be used on electric sanders must be with continuous band and in good conditions. After the slabs have been drilled or cut they must be handled and positioned more carefully



For holes having a max. diameter 8-10 mm, use diamond or tungsten bits for glass or porcelain stoneware mounted on electric drills. Do not hammer-drill and start with a slow rotation speed. Do not press too much on the surface. It is recommended to cool the tool and the drilling point with water.



For holes with diameter over 8-10 mm, use diamond cup cutters mounted on drills or on grinder. Start drilling keeping the tool sloped to the slab. These tools can be used dry or with water.

FLOOR APPLICATION

LIGHTKER 3+ and 5 are suitable to be applied on any type of building screed with the proper installation features. Please note that a correct product application largely depends on the screed conditions.

Before starting the application on whatever substrate, check the latter has the following features:

- is completely clean without grease, oils or dust;
- is dry, without cement residues, resins, paints and loose or not completely bond parts. In such conditions, it is basic to clean the surface and remove the residues;
- is perfectly compact and resistant;
- is flat; flatness is checked by a 2-m long rod laid on the screed in all directions; the allowed tolerance is 3 mm. It is also basic to smooth flatness differences by suitable self-levelling products;
- is solid, without cracks and has finished the usual hygrometric shrinkage. In case of slightly cracked or non-solid screeds, it is recommended to use a crack-preventing mat between substrate and slab; recommended to use a crack-preventing mat between substrate and slab;
- has a suitable hardness and mechanical resistance to stresses due to the final uses;
- is sufficiently thick;
- has been prepared using perimeter bands and expansion joints as necessary.

Besides the general features applying to all substrates, it is necessary that:

traditional cementitious screeds are cured, compact and homogeneous throughout their thickness (at least 4 cm). Usually, 7-10 curing days are necessary for every screed thickness cm. This indication must be checked and given by the Work management.

Concrete substrates are sufficiently cured (at least 3 months). They must not show crust, irregular surface, strippers, old adhesives, anti-evaporating treatments or other substances that could jeopardize the slab bonding.

The substrate shall have structural and sectioning joints depending on the surface type and dimensions. It is also basic that slabs are insulated against any rising damp. Anhydrite screeds must be sand-papered, de-dusted and dried and have an allowed humidity content lower or equal to 0.5%. Screeds in heating floors must be solid, already hygrometrically cured and shrunk, without cracks that must be levelled with epoxy resin products. Further, they must feature a good mechanical resistance to stresses according to their final use. It is basic to check that the heating system has been switched on respecting the screed curing times according to the used material. Also make sure that the thermal shock has been performed, according to the norm UNI EN 1264, considering the instructions supplied by the manufacturer. It is important to use a deformable or highly deformable adhesive able to suit the screed expansion movement, thus balancing the tensions generated on the coating.

Screeds with fast drying are screeds with fast drying and controlled shrinkage; apply checking the time indicated by the manufacturer of the used material.

If there are heating coils, check that the thermal shock has been performed

Application on existing floor

Before the application, check that the existing floor is dry, clean, solid, stable, anchored on the substrate and without loose parts. The substrate must be perfectly flat (max. 3 mm tolerance allowed). Measure the flatness using with an aluminum rod at least 2-m long. Flatness differences must be smoothed by suitable self-levelling products.

Before the application, clean the substrate with a solution of water and sodium hydroxide, then rinse carefully. If a chemical cleaning cannot be made, a mechanical abrasion is recommended, which is mandatory for coatings in marble, wood, PVC. Depending on the substrate to be coated, to improve the bonding to the support as possibly recommended by the manufacturer of the used adhesive, it may be necessary to use a primer.

For the application on existing floors in ceramic, stone, marble, cotto and PVC remove all oil, wax and grease residues.

For the application on parquet, sand-paper the latter till exposing the raw wood.

For the application on other wooden surfaces it is basic that the place is perfectly dry and that the wooden surfaces are assembled according to the manufacturer's indications.

Adhesive and application



Check for the flatness of the screed or of the existing floor. Flatness differences can be smoothed by self-levelling products.



The choice of the squeegee to be used depends on the finishing and flatness of the substrate and is directly proportional to the slab dimensions. Generally, for a slab 1000x1000 mm, it is recommended to use a squeegee with 6-mm sloped teeth for the substrate and a squeegee with 3-mm sloped teeth for the slab back side.



Apply the adhesive with the back-buttering method in full bed, first on the slab back side and then on the substrate, caring to cover corners and edges, too, and avoid air gaps between substrate and slab. Apply the adhesive gradually only on the surface involved in the application of a slab, to avoid surface film that could jeopardize bonding.



Lay the slab carefully on the long side and, keeping it slightly sloped, lower and apply it and make it adhere on the substrate.



Fit the spacers to create the wished joint: it is recommended to use suckersto aid the exact slab positioning.



Beat on the surface using a rubber coated squeegee caring to eliminate gaps and air bubbles. Always check the perfect adhesion of corners and edges. Do not walk on the floor during and after the application, respecting the trampling time indicated by the adhesive manufacturer.

JOINTS



A min. joint of 2 mm is recommended for indoor applications, to be evaluated depending on the dimensions of the slab and of the area and on possible heating floors.

For outdoor applications a min. joint of 5 mm is recommended; it shall be defined depending on the size, on thermal shocks and on the slab color. Outdoors, it is important to check if the screed is free from any rising damp. It is basic to choose the materials to be used depending on the width and finishing the joints must have. Before grouting the joints it is recommended to respect the time indicated by the adhesive manufacturer: epoxy resin or cement based products can be used. The latter ensure a better evenness and color fastness in time.

EXPANSION JOINTS

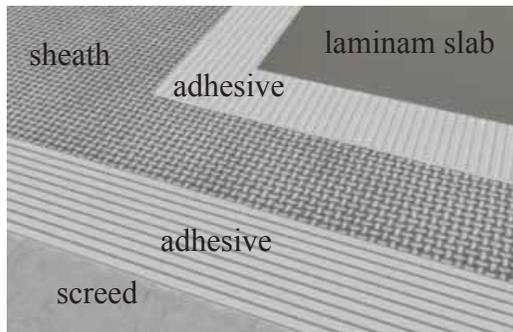


During the application it is strictly necessary to respect all structural expansion joints in the substrate. In case of much extended surfaces, create fractioning joints of about 8/10 mm dividing the area as follows:

- On highly trampled surfaces and on substrates subject to movements and bending, outdoors it is necessary to arrange squares of about 9-12 m² (longer side anyway not exceeding 4 m).
- On indoor solid surfaces it is possible to arrange joints about every 20-25 m².
- Create perimeter joints applying Laminam at about 5-7 mm from columns, walls, edges and corners, caring not to fill this gap while grouting the joints. Fill the expansion joints using profiles or specific products.

The dimensions and spacing of the joints will be decided by the Work Management.

INTERMEDIATE SHEATHS/BLANKETS BETWEEN SCREED AND SLAB



The use of sheaths or blankets between screed and slab enables:

- to intercept possible rising damp from the screed by using water-proofing products or insulating sheaths;
- to apply on screeds not perfectly cured, heated, with non-levelled shrinkage (splits) or non-solid screeds, using anti-fracture blankets to be positioned between screed and slab;
- to improve the trampling sound insulation of floors, placing sound-deadening blankets between screed and slab;
- to create new fractioning joints: if it is not possible to respect the fractioning joints in the screed or in the existing floor to be coated, place an anti-fracture membrane between substrate and slab.

The application is made by bonding the membranes on the substrate, then proceeding with the slab application as usual. Structural joints must be respected and new fractioning joints on the new coating must be arranged.

WALL APPLICATION

LIGHTKER 3+ can be applied on outdoor walls in concrete or cementitious render. In case of mixed substrates with reinforced concrete frame and brick curtains it is necessary to dress the wall before the application, reinforcing the render with suitable mesh at least close to the material change.

The render shall be suited to receive a ceramic coating, thus it must be made with a cementitious grout ensuring high mechanical resistance to flexure and high bonding on walls (bonding to substrate about 10 kg/cm²).

The substrate must be flat, without cracks and solid and must have finished the usual hygrometric shrinkage. Flatness differences must be previously smoothed by suitable levelling products. Cracks or splits must be de-dusted and sealed with suitable materials.

Before the application, make sure the substrate is dry, without dust, grease, oils and loose or not completely bond parts (concrete, paints, lime...) that shall be suitably removed.

Choice of sizes, joints and clearance

The application in outdoor facades is subject to strong thermal expansions:

when choosing the slab size, it is recommended to evaluate the sun exposure, the geographical position and the slab color (dark colors and black in particular attract heat more, with a following higher thermal expansion). The choice of the size to be used in the facade shall be carefully evaluated to enable the operator a correct installation (handling, back-buttering, bonding and beating) depending on the height of the wall and of the site equipment (scaffolds, cranes, lifts). Generally, it is recommended to reduce the size as height increases.

Respect the norms in force in relevant country. The application must be made with wide joint: generally, a 5-10 mm joint is recommended, to be defined according to the weather conditions and slab dimensions.

Respect the structural joints and arrange fractioning joints close to the string course bands, corners and edges and every 9-12 m² with longer side not over 4 m. Joints must be sealed with suitable materials available on the market.

APPLICATION ON INDOOR WALLS

The substrate must be flat, without cracks and solid and must have finished the usual hygrometric shrinkage.

Flatness differences must be previously smoothed by suitable levelling products. Cracks or splits must be de-dusted and sealed with suitable materials. LIGHTKER can also be installed on existing wall coatings: before the application, make sure the existing coating is solid, stable, anchored on the wall and without loose parts. The substrate must be flat. Flatness differences must be smoothed by suitable levelling products. Before the application, clean the existing wall coating with a solution of water and sodium hydroxide, then rinse carefully. If a chemical cleaning cannot be made, a mechanical abrasion is recommended. Depending on the substrate to be coated, it may be necessary to use a primer to improve bonding on the substrate, as possibly recommended by the manufacturer of the used adhesive.

Choice of sizes, joints and clearance

The choice of the size and of the type shall be made also according to the handling and logistics possible on the site. Joints of min. 1 mm are recommended, depending on the size of the slab and on the dimensions of the wall to be coated.

Before grouting the joints respect the time indicated by the adhesive manufacturer: epoxy resin or cement based products can be used. The latter ensure a better evenness and color fastness in time. Respect the structural joints and arrange fractioning joints close to the stringcourse bands, corners and edges and approximately every 20-25 m² of surface. Joints must be sealed with suitable materials available on the market.

ADHESIVE AND APPLICATION

It is important to use a deformable or highly deformable adhesive able to suit the coating natural expansion movement, thus balancing the tensions generated on the substrate. On crumbled or very absorbing renders it may be necessary to use a professional water-based concentrated insulating product (PRIMER), according to the indications given by the chosen adhesive manufacturer.

Apply the adhesive in full bed with backbuttering both on the substrate and on the slab, caring to cover corners and edges, too. The quantity of used adhesive must be directly proportional to the slab dimensions and to the substrates features. The operator shall choose the squeegees to be used: generally smooth or 3-mm toothed squeegees are to be used on the slab and 6-9-mm sloped toothed squeegees are to be used on the substrate. It is important that the quantity of adhesive ensures an application without air gaps between slab and substrate.

Apply the adhesive gradually only on the surface involved in the application of a slab, to avoid surface film that could jeopardize bonding.

Complete the operation beating the surface by suitable rubber coated squeegees to ensure a perfect bonding and to remove possible air gaps.

CLEANING AND MAINTENANCE

LIGHTKER can be cleaned very easily. Anyway, a few measures are recommended to obtain the best results. Preventive tests must be made on a small material part with the product to be used, so as to check that it will not damage the surfaces.

Cleaning after the application

After having completed the material application and the joint filling the ceramic surface must be cleaned to remove all possible contaminating agents (cement or grout residues, etc.). It is basic to carry out this operation correctly as, if badly or non-carefully carried out, it could result in halos jeopardizing the daily cleaning. For a correct cleaning, always follow the specific indications by the manufacturers of grouts and adhesives used in the application as for waiting times, products to be used and use procedures.

In case of large surfaces, it is recommended to use single brushes with soft disks.

It is not recommended to clean after the application if the slab temperature is high, preferring the fresher hours in the day.

Cementitious products

Residues of concrete, slurry, lime and cementitious grouts can be removed using detergents based on buffered acids according to the times and methods indicated by their relevant manufacturers. Such products must be used according to the methods specified in the relevant sheets. Anyway, consider that this operation can be more or less aggressive depending on the type of used detergent and also on:

- possible use of abrasive substances or means;
- temperature (high temperatures can make a detergent more aggressive);
- contact time (as the contact time increases, the risk of chemical etching increases, too).

After cleaning with chemicals it is necessary to rinse with clean water.

It is basic instead to immediately remove cementitious grouts with additives (resins, latexes ...).

Epoxy product

It is necessary to eliminate epoxy grout residues immediately after the application, using a sponge and plenty of clean water.

Then, clean more thoroughly with alkaline detergents, caring to follow the instructions on the labels of the used products.

Routine cleaning

To clean the Lightker slabs daily it is possible to use mild detergents or degreasers. They must be diluted in water according to the indications specified on their packages. Glossy coats may form on the slab surface in time and with the use of standard detergents available on the market. A few beverages, such as coke, water and wine, if spilled on the floor, can eliminate such coats and restore the original look. Dull halos of this type are thus the only clean parts of the floor. To avoid the formation of wax and glossy coats use only mild detergents for the routine cleaning; for removing such deposits, it is instead necessary to dewax the whole floor.

Extraordinary cleaning

Used to remove particularly resistant stains or residues. Generally, it is recommended to carry out a first cleaning with plenty of hot running water. If this operation is not sufficient, depending on the nature of the staining agent it is possible to use increasingly strong cleaning techniques with the following methods:

- non-abrasive detergents with neutral pH
- abrasive detergents
- acid or basic detergents
- thinner-based detergents

The following table summarizes a few cleaning instructions for different stain types :

Staining agent (24 h)	Cleaning method
Green staining agent, vaseline grease, olive oil, coffee, tea, tomato, balsamic vinegar, coke, red wine, shoe polish, iodine, methylene blue	Cleaning with hot running water
sludge-type grease, potassium permanganate	Cleaning with abrasive detergents
dark nail enamel	Cleaning with nail solvent
indelible marker	Cleaning with solvent (nitro thinner)

SILCERAMICHE

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