

Technical
Manual /

Laminam 3+
1000x3000x3.5mm

Laminam 5
1000x3000x5.6mm

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1 / The product

Made from porcelain stoneware, the slabs are produced using innovative technology; compacting the material before firing in a hybrid, dual-supply (gas then electrical) kiln at temperatures of over 1,220°C, approximately. This kiln is designed to ensure an even product. Slabs produced in this way are completely flat.

Laminam is produced in all types in Full Size, 1000x3000 and smaller sizes can be produced by cutting or trimming to ensure accurate sizing.



Laminam 3+

Features

Laminam 3+ is made up of the basic slab with the structure reinforced with fibreglass matting applied on the back using special adhesive.

Nominal thickness: 3mm

Use of Laminam 3+

- > Building sector: residential floor and wall covering applied using adhesive, on screed or preexisting floors by glueing, in environments not affected by heavy traffic.
- > Curtain walls / ventilated walls
- > Interior design sector



Laminam 5

Features

Laminam 5 is the basic slab, Laminam 5 can be simply cut to obtain different shapes and formats.

Nominal thickness: 5.6 mm

Use of Laminam 5

- > Building sector: covering of indoor and outdoor floors on screed or preexisting floors by glueing, in environments not affected by heavy traffic or concentrated loads.
- > Ventilated walls (only where fibreglass has previously been applied on the back)
- > Continual walls (only where fibreglass has previously been applied on the back)
- > Interior design sector: horizontal work surfaces.



2 / packing and packages

Laminam slabs 1000x3000 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 double crate that is stackable).

This packaging has been purposefully studied for overseas shipments of FULL SIZE slabs.

/ In size 1000x1000, Laminam is packaged in cardboard sheets placed on suitable pallets that can be overlapped. During transportation and storage, packaging must be positioned evenly on a flat surface. Several crates or pallets can be overlapped as they are of the same size. Do not overlap other materials that may damage the packaging or slabs in the crates.

**fig.1**

/ Laminam 3+and Laminam 5 size 1000x3000, are carefully packaged on wooden crates that can be overlapped, suitably designed for a damage-free delivery.

**fig.2**

/ A TWIN BED crate is used to transport FULL SIZE slabs. This crate has been specially designed to hold two rows of slabs side by side.

size / mm	pcs per box /	sqm per box /	kg per box /	boxes per pallet /	pcs per pallet /	sqm per pallet /	kg per pallet**** /	total pallet size / mm
Laminam 3+								
1000x3000	-	-	-	-	20	60	566***	1150x3200x260h**
TWIN BED	-	-	-	-	40	120	1171***	3220x2280x280h**
Laminam 5								
1000x3000	-	-	-	-	13	39	602***	1150x3200x260h**
TWIN BED	-	-	-	-	26	78	1360***	3220x2280x280h**

FAO Pallet (suitable for overlapping)

** FAO wooden crate (suitable for overlapping)

*** The weight refers to wooden crate including upper covering

3 / Handling and storage

Laminam 3+, in the size 1000x3000 mm, can be easily lifted and vertically positioned by a single operator and can be handled by two operators. Laminam 5 needs two operators for all handling operations.

Always work keeping a correct posture, avoiding excessive stresses in the lumbar area; wear suitable gloves for a better grip and to avoid abrasions.

3.1 / Palletized package handling by fork lifts

**fig.3**

/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 depth.

**fig.4**

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

**fig.5**

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

3.2 / manual handling and storage



fig.6

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.



fig.7

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.



fig.8

/ Overlap several slabs horizontally, making sure the surfaces are clean and the supporting plane is perfectly flat.

Up to max. 50 Laminam 3 slabs can be overlapped.

3.3 / manual systems handling with suckers



fig.9



fig.9bis

For easier moving the 1000x3000 mm slabs (Laminam 3+), especially when they are fragile due to holes or openings, and to ease use on vertical surfaces, a framework with suckers (EASY FRAME system). Always check that the suckers are properly attached before moving the slab. The frame measures 800x2400 mm and is comprised of two 1200 mm parts. Both are quick to assemble and can be used individually to install sizes smaller than 2400 mm. The suckers are positioned on sliding profiles that allow them to slide, making it possible to create different sizes (fig 9).

There are products on the market that are suitable for handling slabs with thickness greater than 3+, such as those of Brevetti Montolit S.p.A, Raimondi S.p.A. The product Easy Frame cannot be used for surfaces with a textured finish. (fig 9 bis).

4 / Drilling

Laminam 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. It is advisable to cool the attachment point and tools with water approximately half way through cutting and every now and then when necessary. Laminam recommends Brevetti Montolit S.p.A, Raimondi S.p.A and Tyrolit Vincent S.r.l diamond tools.

**fig.10**

To create holes with a maximum diameter of 8-10 mm, use glass or porcelain stoneware bits made with tungsten or diamond, fitted on electric drills. Do not hammer-drill and begin drilling at a slow rotation speed. Do not apply excessive pressure to the surface.

**fig.11**

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.

**fig.12-13**

In case of multiple drills on a single slab, it is recommended to use Laminam 3+. To create openings inside the slab, use continuous band electric sanders with diamond discs and proceed using high rotation speeds (<math><2.500\text{ rpm}</math>) and low advancing speeds. To perform "L"-shaped cuts make a 5 mm hole in the corner, then begin to cut using the sander. The slab carved in this way, particularly when applied to flooring, must be moved and struck with care to avoid cracking the material. Ceramic products, especially in large size, once cut into irregular shapes could, over time, develop some fractures within the normal limits of tolerance for this type of surfaces. To avoid the above mentioned problem, it is recommend, whenever possible, to cut the slabs into several pieces with regular shape (e.g. for the surrounding of doors).

5 / Cutting

The slabs of Laminam 3+ and Laminam 5 can be cut using glass cutters, manual tile cutter, electric disk cutters and manual sanders.

The cut of Laminam 3+ by manual cutter or glass cutter shall be finished by etching the blanket with a standard cutter (see our Transformer Guide). Cutting and drilling, like for all other ceramic products, must be made from the front to the back of the slab.

**fig.14**

It is possible to make cuts easily and accurately using manual devices that can be quickly installed on the building site.

**fig.15**

Etch the slab surface from the edge outside to edge outside, without 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. Laminam recommends using the glass cutter Bohle Silberschnitt 2000.

**fig.16**

Chop off the etched surface at the edges to aid the cut fracturing. For dimensions larger than 1000 mm open the cut by shearing from both etched edges. Grippers that make it easier to open up the cut are available on the market. These include, for example, the 41C Sigma crack gripper.

**fig.17**

For cuts on the long side of Laminam 1000x3000 mm, 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 in figures 15 and 17. Take the slab with open arms on the long side and, starting from the already opened edges, slightly press downwards till shearing completely.

5.1 / Manual tools, special cuts, finishing

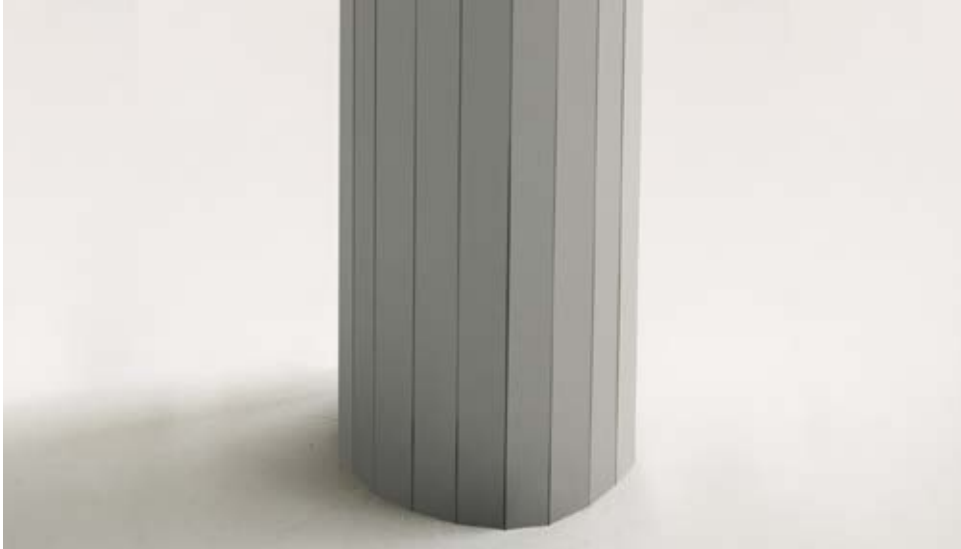
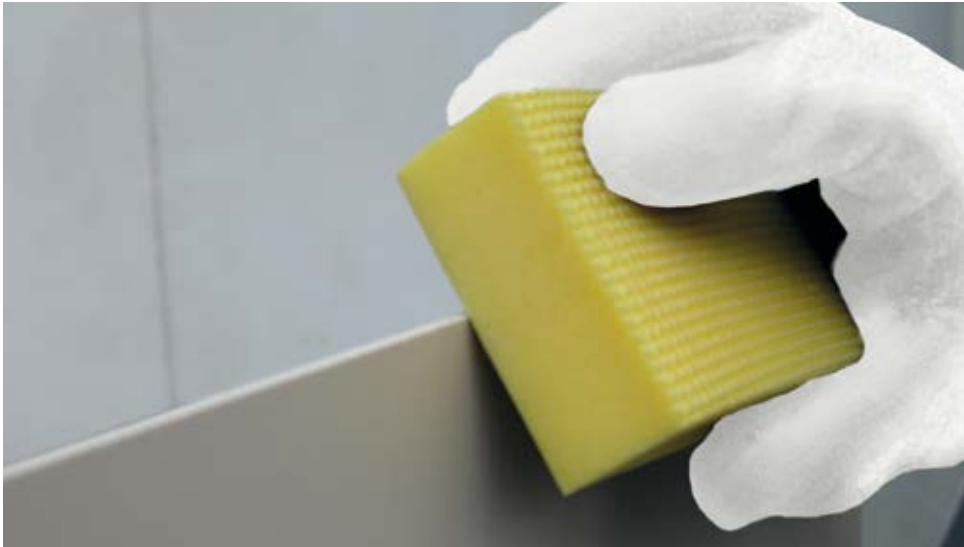


fig.18

Etching the slab Laminam 3+, without cutting the blanket it is possible to obtain strips on mesh that can be easily used to coat rounded parts.

**fig.20**

For a correct finishing and to avoid sharp edges it is important to use diamond sponges available with different weights on the market.

Depending on the way in which the diamond sponges are used, chamfered (one passage) or beveled (several passages) effects can be produced.

**fig.21**

Diamond discs or diamond pads can be installed on grinders to obtain polished effect, in conjunction with tools such as a Brevetti Montolit S.p.A diamond profile wheel, can be used to create a 45°, rounded finish or Adi S.p.a or Raimondi S.p.A discs for polishing.

6 / Splashback mounting

Cooktop Installations

Gas and Electric Cook tops require the installation of a suitable heat resistant board directly behind any acceptable heat proof material less than 5mm thick to provide additional protection for the wall structure, and to ensure compliance with the relevant New Zealand Building Code requirements (AS/NZS 5601.1:2013). This includes the Laminam 3mm tile product.

The 5.6mm Laminam complies with the above codes and does not require any further heat resistant products.

Substrates

- Minimum 10mm gypsum plasterboard or;
- Minimum 6mm fibre cement

For full details refer to the AS/NZS 5601.1.2013 standard

Cooktop Installations - Laminam 3+ (3.5mm)

Installation of 3.5mm Laminam behind a gas cooktop that is less than 200mm from the burner will require a heat resistant board, such as Promat, to be installed behind the Laminam.

Promat must be installed to a minimum height of 150mm above the benchtop level across the full width of the cooktop. Mechanical Fixings must be used. This can be seen in Figures 1 - 5 below.

fig.1
/Kitchen layout

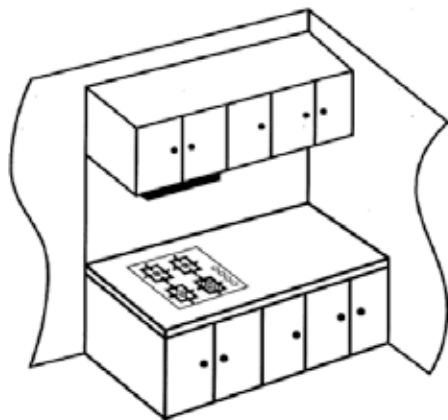


fig.2
/Mark out Promat board position directly behind cooktop and to minimum height of 150mm above the benchtop

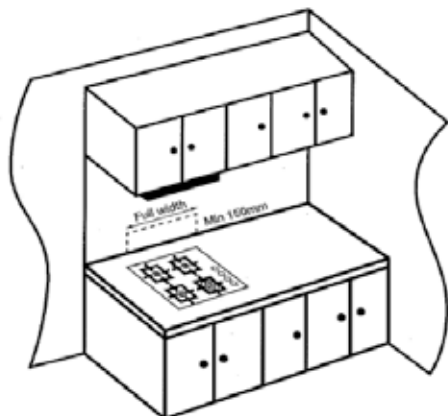


fig.3
/Remove plasterboard behind cooktop with plasterboard saw, exposing stud wall

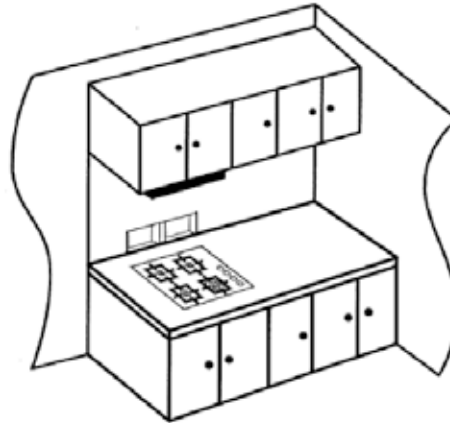


fig.4
/ Installation of Promat onto stud wall with self-tapping screws into the studs

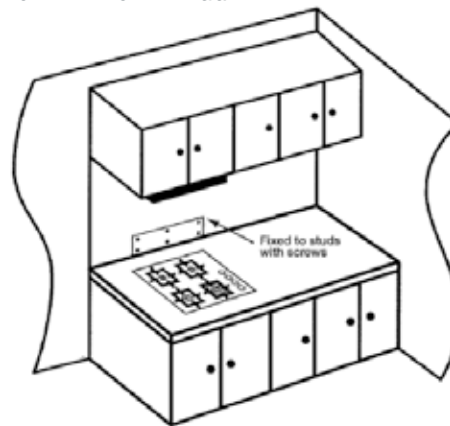
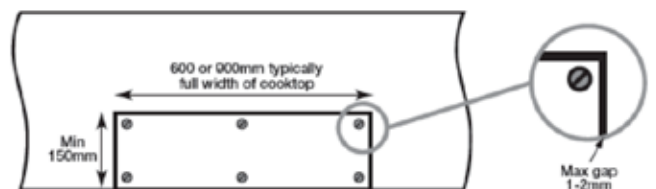


fig.5
/ Installation of Promat onto stud wall with self-tapping screws into the studs



Promat is not required where splashbacks are installed directly onto rendered brick and/or cement brick walls.

Surface preparation – plaster board & cement sheet

The wall area must be a dry and clean surface, free from any crumbling plasterwork, grease or major surface damage. Crumbling plasterwork should be removed with a scraper blade or sanded off, or if severe, it must be repaired with plaster filler or patched with a suitable piece of plasterboard. Grease should be removed with isopropanol (IPO) or thinners and wiped dry. All nail heads must be punched in. Residual glue or plaster filler should be sanded or scraped off.

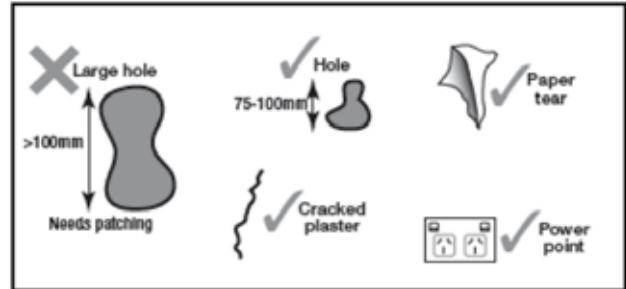
Surface preparation – bricks or cement blocks, grey coat render or white coat plaster

The wall area must be a dry and clean surface, free from any crumbling plaster, mortar, sand, grease or major surface damage. Crumbling plaster should be removed with a scraper blade or sanded off, or if severe, it must be repaired with plaster filler. Grease should be removed with isopropanol (IPO) or thinners and wiped dry. Residual mortar or plaster filler should be sanded or scraped off. Sandy or loose render on brickwork or cement blockwork must be sealed.

Any holes larger than 100mm across must be patched or filled. Electrical or plumbing penetrations should be cut to slightly oversized for ease of installation, however they should not be excessively oversized to ensure wall integrity. Figure 6 should be used as a reference for the recommended repair method for any damage to the wall.

fig.6

/ Wall damage and recommended repair requirements



7 / Floor application

Laminam 3+ and Laminam 5 are designed to be installed on any newly-built or pre-existing building substrate, provided that this substrate possesses suitable mechanical strength and finishing for the installation.

Flatness

For all types of substrate flatness must be checked with a 2 m-long rod, rested on the screed in all directions. The permitted tolerance is 3 mm.

If the substrate is not flat along the majority of the surface to be installed, level the entire area using suitable products.

If the base is not flat only in certain areas, correct this by removing or scraping away the excess parts and filling any holes using the same adhesive as for the subsequent installation.

Before making any adjustments to the substrate, always carry out all procedures required to ensure that the materials used adhere to the existing substrate.

Consistency

Ensure adequate consistency and mechanical strength for all types of substrate.

Before installing slabs on existing floors, check that these floors are fully anchored and produce a full sound when struck. Take care to remove all parts that are not fully adhered to the substrate. Fill in the areas removed with suitable levelling products to restore the flatness of the installation area.



fig.22

7.1 / Installation on screed



fig.23

Resistance

The screed must ensure suitable crushing strength for the final use. Rooms for civil use, for example, must possess a crushing strength of at least 200 kg/cm².

Level of compactness and surface hardness

The screed must be smooth and even along the entire depth and must therefore not have any brittle or detached parts. Check the surface by striking it with a mallet of approximately 750 g. This should produce a full sound and should not leave impressions or generate dust or cracks.

It should not be possible to deeply cut, crumble or chip the surface of the screed if it is scratched with a steel nail.

Thickness and rigidity

An unsolarised screed must be at least 4 cm thick. Any pipes must be sunk by at least 2.5 cm and, in correspondance with these, the screed will be reinforced with a 2 mm diameter galvanised wire.

The screed must be rigid and must be bent once laid. If there are insulating layers, for example thermoacoustic layers or radiant heating panels, the thickness of the screed must be increased according to the density of the insulator used. This prevents deformations.

Seasoning and drying

The screed must have completed the normal hygrometric shrinkage. Generally, 7 - 10 seasoning days for every cm of thickness are envisaged for this type of concrete. Check for humidity prior to installation. Concrete screeds with a humidity value of below 2% are considered to be compliant.

Finish and cleaning: the finish can be created with steel discs, helicopter or hand trowel, taking care not to make the surface too smooth.

Prior to installation, the screed must be clean and any cement residues, brittle parts or parts not yet fully anchored must be removed.

Welding and cracks

If the screed is created in several rounds, expansion joints must be used at the connections points. These joints must always be made vertically. Alternatively, a solution of water and binding agent can be applied to the hardened part to ensure adhesion.

Any cracks that become apparent following hygrometric shrinkage must be sealed before beginning the installation. Proceed by removing brittle parts close to the crack. De-dust these parts and weld them using epoxy resin such as Eporip resin by Mapei. Expansion and desolarisation joints: the screed must be desolarised according to the supporting structure by applying a polyethylene sheet, taking care to overlap the sheet by at least 10 - 15 cm and weld it using adhesive tape.

Apply compressible perimeter bands with a height at least equal to that of the screed and create vertical expansion joints at approximately every 25 m² as well as close to doors.

Anhydrite screeds

Make the screed self-levelling as shown in the material manufacturer's instructions. In addition to general checks of screeds, anhydrite screeds must be sanded and de-dusted and have a humidity content of 0.5%.

Prior to installation, a primer must be applied, as indicated by the manufacturer of the glue used.

Heated floor screeds

In addition to the indications given in the general information for screeds, it is essential to ensure that the thermal shock has been performed, in accordance with UNI EN 1264-4, switching on the heating at an operating temperature of between 20° and 25° and maintaining this level for at least three days. Gradually increase the temperature by approximately 2° per day until the maximum operating temperature is reached. Maintain this temperature for four days. Once the thermal shock has been carried out, it is essential to carefully weld

any cracks caused by shrinkage. (see Welding and cracking of screeds in general conditions). Only proceed with the installation after returning the screed to room temperature.

Rapid setting screeds

These are rapid setting, controlled-shrinkage screeds that are supplied ready-mixed and help to create the screed correctly. Therefore, as well as ensuring shorter shrinkage time, the composition of this screed helps to limit the occurrence of the more common faults of traditional screed.

If heating coils are present, check that the thermal shock has been carried out.

Installation on existing floors

Ceramic porcelain stoneware, marble and natural stone after checking the consistency of the existing floor, and that it is fully adhered to the substrate, carry out mechanical abrasion if the surface is smooth or polished. For other types of surface thorough cleaning with a solution of water and caustic soda may be sufficient. Take care to rinse the treated area thoroughly.

If it is not possible to adhere to the expansion joints of the existing floor or there are settlement cracks or specific damage in marble or natural stone floors, apply an anti-breakage mat prior to installation to intercept any movement and make the substrate even.

Installation on parquet / wood and pvc

check that the floor is fully anchored to the substrate, the wood is not exposed to expansions and that it is stable over time. Carry out mechanical roughening until the surface becomes coarse. Prior to installation, apply an anti-breakage mat then install sizes no larger than 1000x1000 mm or 500x1500 mm.

Installation on resin

carry out mechanical roughening of the entire surface, open any cracks and fill them with epoxy resin such as Eporip resin by Mapei.

**fig.24**

Dry installation on screeds

Made by using sulphate panels produced with calcium sulphate, fibre cement or gypsum fibre which have been installed on elevated or floating supporting structures.

There are several types of the above-mentioned substrates on the market, such as Gifafloor by Knauf.

Before laying down the floor, make sure that the manufacturer of the products guarantees its suitability for this use, its resistance and eventual applicable size limitations.

Notwithstanding other provisions offered by the manufacturers, it is generally necessary to clean the product surface, scraping away any difference in the panels or glue residue from the edges. Smooth the sub-floor by applying an anti-breakage mat then proceed with the installation. Use cement based glue after applying the primer if the manufacturer of the panels so requires.

7.2 / Adhesive and installation



fig.25

/ Check the flatness of the screed or existing floor. Uneven areas of flatness can be filled in using self-levelling products or rapid setting glue.

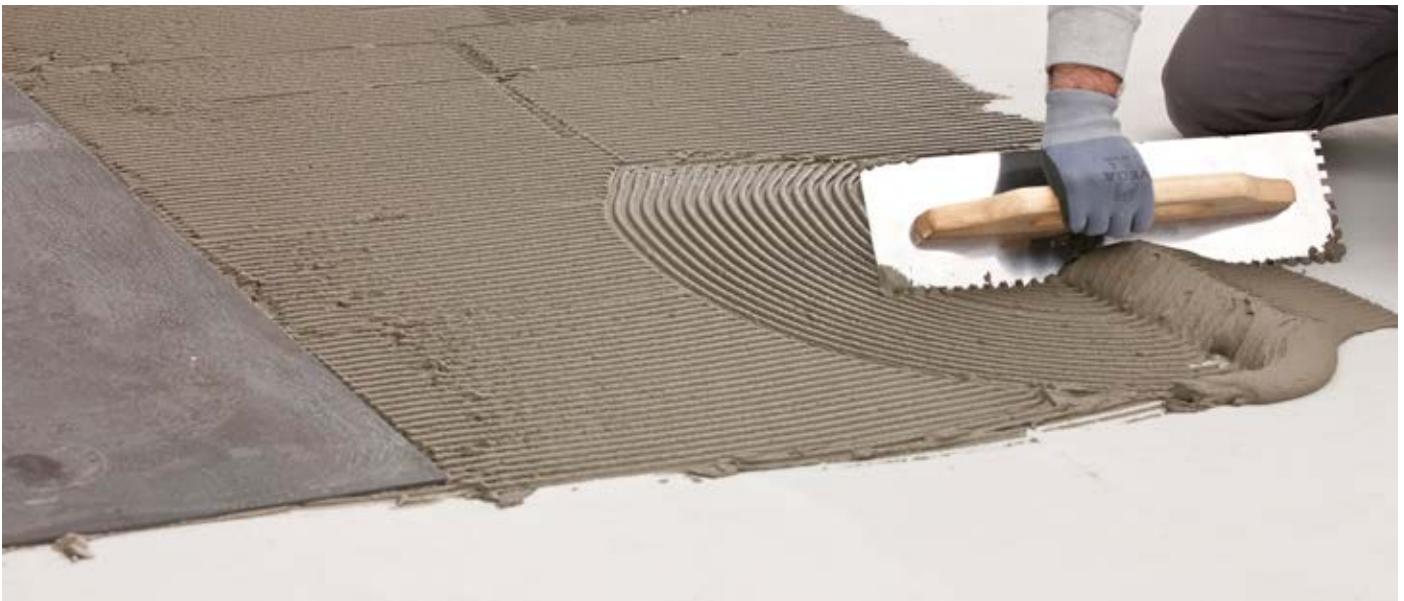


fig.26

/ The choice of squeegee to use depends on the finish and flatness of the substrate and is directly proportional to the size of the slab. Generally, for a 1000x3000 mm slab, you are advised to use a squeegee with sloped teeth of 6/8 mm for the substrate and a squeegee with sloped teeth of 3 mm for the back of the slab.

**fig.27**

/ Apply a double coating of the adhesive in a full spread - first on the back of the slab and then on the substrate, taking care to fully cover the corners and edges and avoiding air gaps between the foundation and the slab. Spread out the glue from time to time (only on the surface involved installing a slab) to prevent films from forming on the surface and compromising the adhesion. In order to facilitate the outflow of air, it is critical that the glue be spread in the same direction both on the substrate and on the back of the slab. Always spread the glue in the direction parallel to the shorter side when installing floors and perpendicular to the floor when installing the slabs as covering.

**fig.28**

/ Beat the surface energetically using a rubber squeegee, starting from the side opposite the applicator and taking care to eliminate air gaps and air bubbles. Always check that corners and edges are fully adhered. Do not tread on the floor during and after installation. Adhere to the trampling times indicated by the glue manufacturer. These times will increase if installing slabs on non-absorbent bases (for example porcelain stoneware floors).

N.B.

Do not walk on the floor during and after installation until the adhesive is completely dry. It is important to respect the times indicated and recommended by the manufacturers of the adhesives, bearing in mind however that for slabs with dimension greater than 1000x1000mm, (especially if installed on non-absorbent materials) times may be longer.

8 / Joints

For Filo products, limit the use of grout to the areas that are to be filled and remove any excess from the surface of the slabs immediately. A groove of at least 2 mm is recommended for indoor installations. This must be assessed according to the size of the slab, the area and whether or not there are heated floors.

For outdoor installations a groove of at least 5 mm is recommended. This must be established according to the size, thermal shocks and colour of the slab. It is essential to select the materials to use according to the width and finish that you intend to give the grooves.

Before plastering over grooves remove the glue and adhere to the times indicated by the manufacturer: cement- or epoxy resin-based products may be used. These products ensure greater evenness and that the colour is maintained over time. However, they require thorough and fast cleaning.

You are advised to use rigid, rubber squeegees rather than spongy ones to apply the plaster.

This produces the effect of greater continuity between the slabs. It is important to immediately clean the slabs really well, especially those from the Filo series (Argento and Ghisa).



fig.29

9 / Expansion joints

During installation, it is essential to respect all structural joints of the building. If the separation joint of the floor does not correspond to those of the screed, the screed fractioning joints must be opened, de-dusted and welded with epoxy resin. When spreading the glue, insert a strip of anti-breakage mat close to the joints.

New joints will be recreated by cutting the screed next to the floor joint.

On stable indoor floors you are advised to provide joints every 20-25 m² and make the long side no larger than 6 m.

Create perimeter joints by installing Laminam at approximately 5-7 mm from columns, walls, edges, corners and fixed structural elements. Take care not to fill this space while plastering grooves.

Fill expansion joints using special silicone profiles or products. The Work Management will be responsible for defining the sizes and frequency of joints.

For outdoor installations provide 9/12 m² panels (maximum of 4 m for the long side).



fig.30/31

10 / Interposing anti-breakage mats

Using anti-breakage mats such as Mapei Mapetex Sel allows you to:

- install on screed that is not fully cured, with shrinkage not filled in, cracks, unstable screed, parquet, marble, ceramic or other existing, damaged substrates.
- Create new fractioning joints, without adhering to the fractioning joints made in the existing screed or floor to be covered, that will be welded with epoxy resin.

Treat the substrate as required to ensure adhesion prior to installation.

Apply the mat using cement- or polyurethane-based glue. This should be the same glue used to install the slabs.

Once the glue has set, install the slabs, again using the double-spreading technique.

It is important that you always respect the structural joints of the building.



fig.32

11 / Installation on wall

Laminam 3+ and Laminam 5 can be installed as both indoor and outdoor tilings. Laminam 3+ is always recommended for areas containing "L"-shaped cuts or frequent drilling. Irrespective of the type of substrate, check the flatness of the substrate using a 2 m rod, rested on the screed in all directions. The permitted tolerance is 3 mm.

It is always advisable to use the Easy Frame when installing the Laminam 3+ the 1000x3000 mm size. When selecting a size for indoor applications take into account the possibility of movement that the rooms to be covered pose. In the case of outdoor coverings, it is recommended to use the size 1000x3000 mm only for limited heights and only when the conditions of the site allow the installer to obtain the best results.



fig.33

11.1 / Installation on outdoor facades

Laminam 3+ and Laminam 5 can be installed on outdoor walls made from concrete or cementitious render. If there are mixed supports with a reinforced concrete frame and masonry infills, the wall must be plastered prior to installation, reinforcing the plaster with a plaster support network

at least next to the variation in material. If plaster is applied to insulating panels such as polystyrene or similar materials used to eliminate the heat channel in beams and pillars, these must be reinforced with a 2 mm galvanised wire and 5x5 mesh, overlapping the adjacent masonry by at least 20 cm and anchored with mechanical plugs. The plaster must be suitable for ceramic tiling. Therefore, it must be made using cement mortar that ensures high mechanical strength against bending and a high degree of adhesion to walls.

The adhesion value in the substrate approximately 10 kg/cm² as requested by the adhesives producers. The substrate must be flat and stable with no brittle parts and must have completed the normal hygrometric shrinkage. Any uneven areas of flatness must be filled in with levelling products. Brittle parts and cracks from shrinkage must be de-dusted and sealed with suitable materials.

Selecting the size, grooves and joints

Installations in outdoor facades are subject to severe heat expansion: when selecting the size of the slab, it is therefore advisable to assess exposure to sunlight, the geographical position and the colour of the slabs (dark colours and black, in particular, attract more heat and consequently are more greatly affected by heat expansion).

The choice of size to use for a facade must be carefully assessed to allow the worker to correctly install it (movement, double spreading, bonding and beating). This will depend on the height of the wall and the building site equipment (scaffolding, cranes, forklifts). Generally, the greater the height the smaller the recommended size.

Adhere to the standards in force in the country you are working in. Slabs must always be installed using double spreading with a wide groove. Generally, a groove of 5 mm is recommended. This will be defined according to climatic conditions as well as the size and colour of the slabs.

In order to facilitate the outflow of air, it is critical that the glue be spread in the same direction both on the substrate and on the back of the slab. To correctly apply the adhesive it is necessary to maintain a uniform thickness and the direction of the glue pattern must be perpendicular to the ground.

Respect structural joints and create fractioning joints next to the stringcourse bands, corners and edges and at every 9 - 12 m², making the biggest side no larger than 4 m. Joints must be sealed with suitable silicone materials. If installing size 1000x3000mm you are advised to plaster all grooves with silicone. Apply the material in accordance with the operating temperatures indicated by the glue manufacturer. Once the tiling has been finished, it is advisable to use all the necessary solutions to prevent water from seeping between the slab and the substrate (closing caps, flashing, etc.)

Installation on coating

Given the high degree of thermal expansion in the materials applied when creating thermal insulation coating, which can also be highly superior to ceramic slabs, it is not possible to cover traditional coating with any type of ceramic or stone material.

Due to its lightness Laminam can be applied to a special coating system by Mapei called the Mapetherm Tile System, if carried out as indicated in MAPEI's technical notes.

The maximum sizes permitted for this type of application are 1000x1000 mm and 500x1500 mm in finishings that guarantee a reflection index of more than 20%.

Installation on drywall

It is possible to install the Laminam slabs as coating on prefabricated walls made of fibre cement or similar products suitable for the intended outdoor use (for example Aquapanel of Knauf). It is necessary to verify that the manufacturer guarantees them for this type of installation, since these walls must not contain materials that can be affected by water and/or moisture.

These products can be installed with or without micro ventilations and, depending on the manufacturer, they may or may not require a preventive screed with fibreglass or the application of a primer in order to optimize the subsequent laying of the glue and the installation of the slabs. Usually on these types of structures it is possible to install the slabs using cement-based adhesives.

11.2 / Installation on indoor walls

Laminam can be installed on plaster with a cement, chalk, plasterboard or other type of base.

The substrate must be flat and stable with no brittle parts and must have completed the normal hygrometric shrinkage. Any uneven areas of flatness must be filled in with levelling products. Brittle parts and cracks from shrinkage must be de-dusted and sealed with suitable materials. Laminam can also be installed on existing floors: prior to installation, ensure that the existing tiling is solid, stable, anchored to the wall and that there are no removable parts. Prior to installation, you are advised to clean the existing tiling with a solution of water and caustic soda, taking care to rinse thoroughly. If chemical cleaning is not possible mechanical abrasion is recommended.

Depending on the support to be covered, it may be necessary to use a primer to ensure that the glue adheres to the support, as recommended by the manufacturer of the glue used.

Refer to the technical advice provided by the glue manufacturer for applications on special substrates.

Selecting the size, grooves and joints

The size and type of slab to select must also be assessed according to the movement and logistics that the building site allows. For size 1000x3000 mm tilings involving difficult drilling or movement you are advised to use Laminam 3+. You are advised to use grooves of at least 1/2 mm, to be assessed according to the size of slab, the size of the wall to be covered and the quality of the substrate.

Before plastering the grooves, adhere to the times indicated by the glue manufacturer: cement- or epoxy resin-based products may be used. These products ensure greater evenness and that the colour is maintained over time. However, they require thorough and fast cleaning.

11.3 / 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.



fig.34

/Check the flatness of the wall to be coated.



fig.35

/Application of the adhesive on the wall.



fig.36
/ Application of the adhesive on the slab back side.



fig.37
/ Application with spacers.



fig.38
/ Application of the slab.



fig.39
/ Grouting.

12 / 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, in thickness suitable for Laminam 3+ and Laminam 5.



fig.38

13 / Cleaning and care

Laminam slabs are easy to clean. It is recommended, however, to take the following steps in order to obtain optimal results.

It is important to preventively test the cleaning product that will be used on a small piece of the slabs to make sure that it will not damage the surface.

Marks or stains found on the surfaces are usually the result of an incorrect and not thorough cleaning.

For the Filo collection's products (Argento and Ghisa) it is necessary to use neutral detergent.

Under no circumstances acid-based products, in the first case, or alkaline products, in the second case, can be used. Please note that, in general, the removal of stains is much easier if cleaning is performed immediately.

Residues of epoxy adhesives must be removed from the surface of the slab before they dry. Removal and cleaning can be carried out with a sponge and abundant clean water.

Afterwards, perform a thorough cleaning using alkaline cleaners being careful to follow the instructions on the labels of the products you are using.

13.1 / Cleaning after the application

The information of this paragraph are not valid for Filo (Argento and Ghisa)

For these texture please see point n. 13.3 and 13.4

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 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.

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

Residue of concrete, slurry, lime and cementitious grouts can be removed using buffered acid-based detergents, according to the times and methods indicated by their relevant manufacturers.

Such products must be used according to the methods specified on the label or in the relevant technical data sheets. However, remember that this operation can be more or less aggressive depending on the type of detergent used and also depending on:

- temperature (high temperatures can make a detergent more aggressive);
- contact time (as the contact time increases so does the risk of etching).

After cleaning with acid-based detergents thorough rinsing with clean water is required. It is however vital to remove residues of cementitious grouts with additives (resins, latexes,...) immediately.

Avoid using abrasive substances or means;

Products for cleaning cementitious grout residues from surfaces:

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

13.2 / Epoxy products

To clean epoxy residues on the Filo collection's products (Argento and Ghisa) please see section 13.3. and 13.4 It is necessary to eliminate epoxy grout residue immediately after installation, using a mildly abrasive sponge and plenty of water.

It is essential to always use clean products and water and replace them frequently. Then, clean more thoroughly with detergents recommended by the grout manufacturers, taking care to eliminate all ring marks.

To make cleaning more efficient you are advised to dry the floor with absorbent paper towels to collect resin residues that, once the water has evaporated, would be deposited once more, causing dull ring marks.

Products for cleaning epoxy grout residues from surfaces:

- 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

13.3 / Cleaning Filo series

The cleaning post installation of Filo collection's products (Argento and Ghisa) must be carried out quickly after completing the grouting using clean water and sponges until all residues are removed. Acid-based products cannot be used to clean slabs of this series, so the removal of dried residual adhesives and grouts (both epoxy and cement based) could not always be possible

The ordinary cleaning of above surfaces should be made with water and neutral detergents.

Alcohol for domestic use and possibly basic agents (such as bleach) may be used for more

stubborn grime, however it is necessary to rinse with plenty of water after using them. Perform the cleaning using a soft sponge dampened with water and detergent, followed by rinsing and drying of the treated surface with a dry cloth to remove any residual dirt or detergent. The cleaning recommendations and procedures below are provided for informational purposes only. Always perform a preliminary test on a slab that was not installed or on a portion of the surface located in a hidden area to verify that the methods and products used do not cause damage to the surfaces.

Filo

textures /	operation /	detergents producers / cleaning product /
Argento and Ghisa	cleaning post installation (cement grout)	>Fila/Fila Deterek (1:20 dilution) >Faber Chimica/Cement Remover (20% dilution for maximum 10 minutes)
	cleaning post installation (epoxy grout)	>Fila/ Fila Cr10 >Faber Chimica/Wax Remover (20% dilution for maximum 10 minutes)
	intense cleaning	>Fila/ Fila Cleaner or Ps87 (dilution 1:30) > Faber Chimica/Tile Cleaner (10% dilution for maximum 10 minutes)
	ordinary cleaning	> water and neutral soap >Fila/Fila Cleaner (dilution 1:200) >Faber Chimica/Floor Cleaner
	limestone stains	>Fila/FilaBrio

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

13.4 / Intense cleaning

/ Used to remove particularly tough stains or residues. Generally, it is advisable to carry out an initial cleaning with hot water and mild detergent. If this operation is not sufficient, depending on the nature of the staining agent, it is possible to use increasingly strong cleaning techniques, using a few special products such as:

/ Non-abrasive detergents with neutral pH
 / Abrasive detergents
 (excluding Filo- Argento and Ghisa)
 / Acid or basic detergents
 (excluding Filo- Argento and Ghisa)
 / Thinner-based detergents
 (excluding Filo- Argento and Ghisa)

The following table summarizes a few cleaning instructions for different stain types taken from tests made on the product Collection Neve.

staining agent /	type /	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	Cleaning with hot running water
Greasy and oily substances	mild or degreasing detergent	Fila PS 87 Faber chimica - Coloured stain remover any other mild or degreasing detergent
Rust / metal marks	acid-based detergent	Fila Deterdek diluted muriatic acid available on the market
Chalky residues	acid-based detergent	Descaling Detergent cillit bang super cleaner for limestone and stubborn dirt Faber chimica - tile cleaner
Ink/ Felt-tip pen	thinner-based detergents	Fila PS/87 - Fila SR/95 Nitro Thinner, White Spirit, acetone
Tire	strong graffiti cleaner	Fila Ps/87
Graffiti	strong graffiti cleaner	Fila No Paint Star

NOTE: Effective on all our products except items in the "FILO" metallic series an Lucidati. When using acid detergents we recommend that you always carry out a test on an uninstalled tile or on a hidden portion of the surface. Rinse the surface thoroughly with water after application then dry the surface in order to remove all detergent and dirt residues.

13.5 / Ordinary cleaning


To clean the Laminam slabs daily it is possible to use mild detergents. They must be diluted in water according to the indications specified on their packages. Matt 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 these coats use only mild detergents for the routine cleaning; for removing such deposits, it is instead necessary to dewax the whole floor.

Below you find a certificate that summarizes a test made on Laminam slabs from the CATAS (authorized center of research).

Surface resistance to cold liquids (cleaning products PTP 53:1995)

Products	Contact time: 16 h
Cif Gel con candeggina	5*
Cif Spray Attivo con candeggina	5
Cillit Bang Calcare e Sporco	5*
Cif Power Cream Cucina	5
Ajax Classico Universale	5
Glassex con ammoniaca	5
Vetril Multiuso Igienizzante	5
Candeggina Ace	5
Viakal	5*
Alcool denaturato	5
Ammoniaca (sol.6/7%)	5
Mastro Lindo	5
Ajax pavimenti	5
Rio Casamia pavimenti	5
Lysoform Casa	5



RAPPORTO DI PROVA

138119 / 1

Ricevimento campione: 29-02-12
 Esecuzione prova: 13-03-12
 Emissione rapporto: 16-03-12

Evaluation

5 > no defects
 4 > slight change in colour or gloss
 3 > moderate change
 2 > strong mark
 1 > structure changed

NOTE:
 The test method is in accordance with EN12720:2009

* Excluded
 Filo (Argento and Ghisa)

14 / Technical specifications

Laminam 3+

Laminate porcelain obtained by wet grinding of clayish raw materials, granite and metamorphic, feldspar-containing rocks and ceramic pigments. Compacted by a special shaping in compatter and sintering at 1200°C, with hybrid firing. With single gauge square edge and with a structural reinforcement in inert material (fiberglass blanket bonded at the back).

Laminam 5

Laminate porcelain obtained by wet grinding of clayish raw materials, granite and metamorphic, feldspar-containing rocks and ceramic pigments. Compacted by a special shaping in compatter and sintering at 1200°C, with hybrid firing. With single gauge square edge.

15 / Recommended adhesives

The following tables show a selection of commercially available adhesives recommended for installing Laminam, depending on the kind of the substrate. These guidelines have been provided by the manufacturers of adhesives based on tests and trials in their laboratories.

The installation of Laminam 5 requires the same procedures of regular porcelain stoneware with the same size; the use of Laminam 3+ requires an adhesive that ensures proper bonding between the substrate and the fiberglass reinforcing mat on the back of the slab. All products must be used according to the instructions and warnings contained in the Technical Data Sheets of the same.

The tables refer to the installation of size 1000x3000 mm slabs, unless otherwise indicated. If smaller sized slabs are installed, it might be possible to use adhesives with different technical characteristics or less efficient. It is recommended, however, to reduce the size for outdoor installation in internal when the substrate is wood, PVC, rubber or metal, leaving to the installer and D.L. the responsibility for choosing the maximum size, which needs to be assessed on a case-by-case basis. Because of the extreme variability of the substrate, in specific cases, it is advisable to seek the advice of an expert from the company manufacturing the chosen adhesives to identify which products are best suited for the installation and eventual preparatory operations.

NOTE:

The trade names of the adhesives indicated refer to products for the European market. We therefore recommend contacting the branch of the manufacturer chosen in the country the installation is to be carried out in, in order to check that the name of the product is the same as the one indicated in the tables.

Floor indoor

Laminam 3+ Laminam 5

Anhydrite, concrete screed (*) /
quick screed, ready-mad / Old
ceramics / stone materials

Concrete heating screeds,
Anhydrite heating screeds
(*) /

Mapei	normal setting	ULTRALITE S2 / KER- ABOND +ISOLASTIC	C2E S2	ULTRALITE S2 KERABOND+ISOLASTIC	C2E S2
	quick setting	ULTRALITE S2 QUICK / ELASTORAPID	C2FE S2 C2FTES2	KERAQUICK + LATEX PLUS	C2FT S2
Laticrete	normal setting	LATICRETE 254 PLATINUM (no anidrite)/	C2TE S1	LATICRETE 254 PLATINUM (no anidrite)/	C2TE S1
	quick setting	LATICRETE 4237R + 211	C2TF	LATICRETE 4237R + 211	C2TF
Kerakoll	normal setting	H40 ECO FLEX/	C2E	H40 ECO EXTRAFLEX/	C2TE S1
	quick setting	H40 ECO RAPID/	C2FTE	H40 ECO RAPIDFLEX/	C2FTE S1
Pci / basf	normal setting	PCI NANOLIGHT + PCI LASTOFLEX (1)	C2TE S2	PCI NANOLIGHT + PCI LASTOFLEX (1)	C2TE S2
	quick setting	-	-	-	-
Litokol	normal setting	CEMENTKOL K21 + 30% LATEXKOL/	C2 S2	CEMENTKOL K21 + 30% LATEXKOL/	C2 S2
	quick setting	LITOSTONE K99 + 30% LATEXKOL/	C2FE S2	LITOSTONE K99 + 30% LATEXKOL/	C2FE S2
Ardex	normal setting	ARDEX X78 MICROTEC + E90	C2 FE(E) S2	ARDEX X78 MICROTEC + E90	C2 FE(E) S2
	quick setting	ARDEX X78 S MICROTEC + E90	C2F(F) S2	ARDEX X78S MICROTEC + E90	C2F(F) S2
Adesital	normal setting	ADEBOND + LATEX EL300/	C2E S2	ADEBOND + LATEX EL300	C2E S2
	quick setting	EXTRA 40 + LATEX R200/	C2FT S2	EXTRA 40 + LATEX R200/	C2FT S2
Technokolla	normal setting	TECHNOLA + TC-LASTIC/	C2TE S2	TECHNOLA + TC-LASTIC/	C2TE S2
	quick setting	TECHNORAP 2/	C2FT S1	TECHNORAP 2/	C2FT S1
Fassa Bortolo	normal setting	ADYS + LATEX DE80	C2TE S2	ADYS + LATEX DE80/	C2TE S2
	quick setting	FASSATECH 2	C2FTE S2	FASSATECH 2/	C2FTE S2

(*) Prior application of PRIMER

(1) PCI Nanolight: put into operation in 24 hours

Floor indoor

		Wood, PVC, Rubber		Iron	
Laminam 3+					
Laminam 5					
Mapei	normal setting	KERALASTIC	R2	KERALASTIC	R2
	quick setting	-	-	-	-
Laticrete	normal setting	LATICRETE LATALASTIK	R2T	LATICRETE LATALASTIK	R2T
	quick setting	-	-	-	-
Kerakoll	normal setting	SUPERFLEX ECO	R2T	SUPERFLEX ECO	R2T
	quick setting	SUPERFLEX ECO	R2T	SUPERFLEX ECO	R2T
Pci / basf	normal setting	PCI NANOLIGHT + PCI LASTOFLEX (1) (after application of PCI Gisogrund 303)	C2TE S2	PCI COLLASTIC	R2T
	quick setting	-	-	-	-
Litokol	normal setting	LITOELASTIC	R2T	LITOELASTIC	R2T
	quick setting	-	-	-	-
Ardex	normal setting	contact ARDEX srl directly	-	ARDEX WA	R2T
	quick setting	contact ARDEX srl directly	-	ARDEX WA	R2T
Adesital	normal setting	ADEFLEX T	R2T	ADEFLEX T	R2T
	quick setting	-	-	-	-
Technokolla	normal setting	ALL 9000	R2T	ALL 9000	R2T
	quick setting	-	-	-	-
Fassa Bortolo	normal setting	AX 91	R2	AX 91	R2
	quick setting	-	-	-	-

wall tiling indoor

Laminam 3+		Concrete/ Old ceramics, marble chip, stone materials/ gypsum (*) or concrete based plaster / plasterboard (*) / Fibre-cement panels / lightweight concrete blocks /	
Mapei	normal setting		
	normal setting	ULTRALITE S2 / KERABOND +ISOLASTIC	C2E S2
	quick setting		
	quick setting	ULTRALITE S2 QUICK / ELASTORAPID	C2FE S2 / C2FTES2
Laticrete	normal setting	LATICRETE 254 PLATINUM	C2TE S1
	quick setting	LATICRETE 4237R + 211	C2TF
Kerakoll	normal setting	H40 ECO FLEX/	C2E
	quick setting	H40 ECO RAPID/	C2FTE
Pci / basf	normal setting	PCI NANOLIGHT + PCI LASTOFLEX (1) (Laminam 3+)	C2TE S2
	quick setting	-	-
Litokol	normal setting	CEMENTKOL K21 + 30% LATEXKOL/	C2 S2
	quick setting	LITOSTONE K99 + 30% LATEXKOL/	C2F S2
Ardex	normal setting	ARDEX X77 MICROTEC/	C2FT(T)E(E) S1
	quick setting	ARDEX X77 S MICROTEC + E90/	C2 F(F)T(T) S2
Adesital	normal setting	ADEBOND + LATEX EL300/	C2E S2
	quick setting	EXTRA 40 + LATEX R200/	C2FT S2
Technokolla	normal setting	TECHNOLA + TC-LASTIC/	C2TE S2
	quick setting	TECHNORAP 2/	C2FT S1
Fassa Bortolo	normal setting	ADYS + LATEX DE80	C2TE S2
	quick setting	FASSATECH 2	C2FTE S2

(*) Prior application of PRIMER

(1) PCI Nanolight: put into operation in 24 hours

wall tiling outdoor

Laminam 3+

Plaster /
Concrete screed /

Mapei	normal setting	fino a 1000x3000 mm	Laminam 3+ : KERALASTIC T	R2T
	quick setting	fino a 1000x3000 mm	Laminam 3+ : KERAQUICK + LATEX PLUS	C2FT S2
Laticrete	normal setting	fino a 1000x3000 mm	LATICRETE 254 PLATINUM (no anidrite)/	C2TE S1
	quick setting	fino a 1000x3000 mm	LATICRETE 4237R + 211	C2TF
Kerakoll	normal setting	fino a 1000x3000 mm	H40 ECO EXTRAFLEX/	C2TE S1
	quick setting	fino a 1000x3000 mm	H40 ECO RAPIDFLEX/	C2TE S1
Pci / basf	normal setting	fino a 1000x3000 mm	PCI NANOLIGHT + PCI LASTOFLEX (1) (Laminam 3+)	C2TE S2
	quick setting	-	-	-
Litokol	normal setting	fino a 1000x3000 mm	CEMENTKOL K21 + 30% LATEXKOL/	C2 S2
	quick setting	fino a 1000x3000 mm	LITOSTONE K99 + 30% LATEXKOL/	C2FE S2
Ardex	normal setting	fino a 1000x3000 mm	Laminam 3+: ARDEX X77 MICROTEC +E90	C2FT(T)E(E) S2
	quick setting	fino a 1000x3000 mm	ARDEX X77 MICROTEC +E90 (Laminam 3)	C2 F(F)T(T) S2
Adesital	normal setting	fino a 1000x3000 mm	ADEBOND + LATEX EL300	C2E S2
	quick setting	fino a 1000x3000 mm	EXTRA 40 + LATEX R200/	C2FT S2
Technokolla	normal setting	fino a 1000x3000 mm	TECHNOLA + TC-LASTIC/	C2TE S2
	quick setting	fino a 1000x3000 mm	TECHNORAP 2/	C2FT S1
Fassa Bortolo	normal setting	fino a 1000x3000 mm	ADYS + LATEX DE80	C2TE S2
	quick setting	fino a 1000x3000 mm	FASSATECH 2	C2FTE S2

special cases

Laminam 3+		Wood, PVC, Rubber		Iron	
Mapei	normal setting				
	normal setting	KERALASTIC	R2	KERALASTIC	R2
	quick setting	-	-	-	-
	quick setting	-	-	-	-
Laticrete	normal setting	LATICRETE LATALASTIK	R2T	LATICRETE LATALASTIK	R2T
	quick setting	-	-	-	-
Kerakoll	normal setting	SUPERFLEX ECO	R2T	SUPERFLEX ECO	R2T
	quick setting	SUPERFLEX ECO	R2T	SUPERFLEX ECO	R2T
Pci / basf	normal setting	PCI NANOLIGHT + PCI LASTOFLEX (1)(after application of PCI Gisoground 303)	C2TE S2	PCI COLLASTIC	R2T
	quick setting	-	-	-	-
Litokol	normal setting	LITOELASTIC	R2T	LITOELASTIC	R2T
	quick setting	-	-	-	-
Ardex	normal setting	contact directly to ARDEX srl	-	ARDEX WA	R2T
	quick setting	contact directly to ARDEX srl	-	ARDEX WA	R2T
Adesital	normal setting	ADEFLEX T	R2T	ADEFLEX T	R2T
	quick setting	-	-	-	-
Technokolla	normal setting	ALL 9000	R2T	ALL 9000	R2T
	quick setting	-	-	-	-
Fassa Bortolo	normal setting	AX 91	R2	AX 91	R2
	quick setting	-	-	-	-

special cases

Laminam 3+

Overlapping floors

Mapei	normal setting	KERALASTIC	R2
	quick setting	-	-
Laticrete	normal setting	LATICRETE 254 PLATINUM	C2TE S1
	quick setting	LATICRETE 4237R + 211	C2TF
Kerakoll	normal setting	SUPERFLEX ECO	R2T
	quick setting	-	-
Pci / basf	normal setting	PCI COLLASTIC	R2T
	quick setting	-	-
Litokol	normal setting	LITOELASTIC	R2T
	quick setting	-	-
Ardex	normal setting	ARDEX X78 MICROTEC + E90	C2 FE(E) S2
	quick setting	ARDEX X78S MICROTEC + E90	C2 F(F) S2
Adesital	normal setting	-	-
	quick setting	-	-
Tecknocolla	normal setting	-	-
	quick setting	-	-
Fassa Bartolo	normal setting	AX 91	R2
	quick setting	-	-

(1) Waterproofing of cement (CM-DM according to EN 14891)

(2) Waterproofing of reactive organics (RM according to EN 14891)

(3) PCI Nanolight: put into operation in 24 hours

special cases

Laminam 3+

Waterproofing systems applied to the substrate to be installed

Mapei	normal setting	ULTRALITE S2 / KERABOND+ISOLASTIC	C2E S2
	quick setting	ULTRALITE S2 QUICK/ KERAQUICK + LATEX PLUS	C2FE S2
Laticrete	normal setting	LATICRETE 254 PLATINUM	C2TE S1
	quick setting	LATICRETE 4237R + 211	C2TF
Kerakoll	normal setting	H40 ECO FLEX (1)	C2E
	quick setting	SUPERFLEX ECO (2)	R2T
Pci / basf	normal setting	PCI NANOLIGHT + PCI LASTOFLEX (3)	C2TE S2
	quick setting	-	-
Litokol	normal setting	CEMENTKOL K21 + 30% LATEXKOL	C2 S2
	quick setting	LITOSTONE K99 + 30% LATEXKOL	C2F S2
Ardex	normal setting	ARDEX X78 MICROTEC + E90	C2FE(E) S2
	quick setting	ARDEX X78S MICROTEC + E90	C2 F(F) S2
Adesital	normal setting	ADEBOND + LATEX EL300	C2E S2
	quick setting	EXTRA 40 + LATEX R200	C2FT S2
Technocolla	normal setting	-	-
	quick setting	-	-
Fassa Bartolo	normal setting	ADYS + LATEX DE80	C2TE S2
	quick setting	FASSATECH 2	C2FTE S2

16 / Technical features

physical and chemical properties /

norm / test method

Laminam 3+

size features /	ISO 10545-2	max. deviation on the side +/- 0.5 mm
size features /	ISO 10545-2	max. deviation on the side +/- 1.0 mm
weight per unit area /	Laminam	average value 8,2 kg/m ²
surface quality /	ISO 10545-2	> 95% of tiles with no visible flaws
water absorption /	ISO 10545-3	average value 0.1% (< 0.3%)
water absorption /	ASTM C373	average value 0.1% (< 0.3%)
breaking strength /	ISO 10545-4*	average value 700 N / camp. 200x300 mm
modulus of rupture /	ISO 10545-4	average value 90 N/mm ² / samples 40x100 mm
scratch hardness (Mohs) /	UNI EN 101	≥ 6
deep abrasion resistance /	ISO 10545-6	≤ 175 mm ³
coefficient of linear thermal expansion /	ISO 10545-8	6,6 x 10 ⁻⁶ /°C
thermal shock resistance /	ISO 10545-9	resistant
resistance to chemicals /	ISO 10545-13	no visible effect
resistance to staining /	ISO 10545-14	class 5
frost resistance /	ISO 10545-12	resistant
impact resistance /	ISO 10545-5	average value 0.8
static coefficient of friction /	DIN 51130	R9
coefficient of friction /	ASTM C-1028	μ > 0,6 dry
reaction to fire /	EN 13501-1	A2 - s1, d0 wall covering A2fl - s1 floor

* For installation on wall only

** Requirement UNI EN 144111 not applicable

> The unique features of Laminam products do not allow for a perfect comparison with ceramic tiles. The test results are therefore only indicative and not binding.

physical and chemical properties /**norm / test method****Laminam 5**

size features /	ISO 10545-2	max. deviation on the side +/- 0.5 mm
size features /	ISO 10545-2	max. deviation on the side +/- 1.0 mm
weight per unit area /	Laminam	average value 14 kg/m ²
surface quality /	ISO 10545-2	> 95% of tiles with no visible flaws
water absorption /	ISO 10545-3	average value 0.1% (< 0.3%)
water absorption /	ASTM C373	average value 0.1% (< 0.3%)
breaking strength /	ISO 10545-4**	average value 1100 N / samples 200x300 mm
modulus of rupture /	ISO 10545-4	average value 50 N/mm ² / samples 200x300 mm
scratch hardness (Mohs) /	UNI EN 101	≥ 6
deep abrasion resistance /	ISO 10545-6	≤ 175 mm ³
coefficient of linear thermal expansion /	ISO 10545-8	6,6 x 10 ⁻⁶ /°C
thermal shock resistance /	ISO 10545-9	resistant
resistance to chemicals /	ISO 10545-13	no visible effect
resistance to staining /	ISO 10545-14	class 5
frost resistance /	ISO 10545-12	resistant
impact resistance /	ISO 10545-5	on demand
static coefficient of friction /	DIN 51130	R9
coefficient of friction /	ASTM C-1028	μ > 0,6 dry
reaction to fire /	EN 13501-1	A1 (decision 96/603/eec as amended)

* For installation on wall only

** Requirement UNI EN 144111 not applicable for Laminam3+

> The unique features of Laminam products do not allow for a perfect comparison with ceramic tiles. The test results are therefore only indicative and not binding.

Important /

The information and data contained in this Technical Guide are drafted on the basis of our extensive experience and technical knowledge regarding the most frequent occurrences we came across during the installation of the Laminam surfaces.

Given the variety of different situations and conditions that may occur, this Technical Guide is to be considered purely indicative. Therefore, before proceeding with the installation, it might be worthwhile for the Project Manager to perform an assessment based on the works to be executed.

For more information
and samples /

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