Laplitec®
Prestigious Italian Surface

CLADDING

Design and installation manual

US _Ver. 0/2017

CONSTRUCTION:
Interior floor and wall cladding

LAPITEC®:
Avorio, Lux and Satin finishes

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CONSTRUCTION:
Outdoor flooring

LAPITEC®:
Bianco Crema, Satin and Vesuvio

1. PRODUCT

1.1/ CHARACTERISTICS

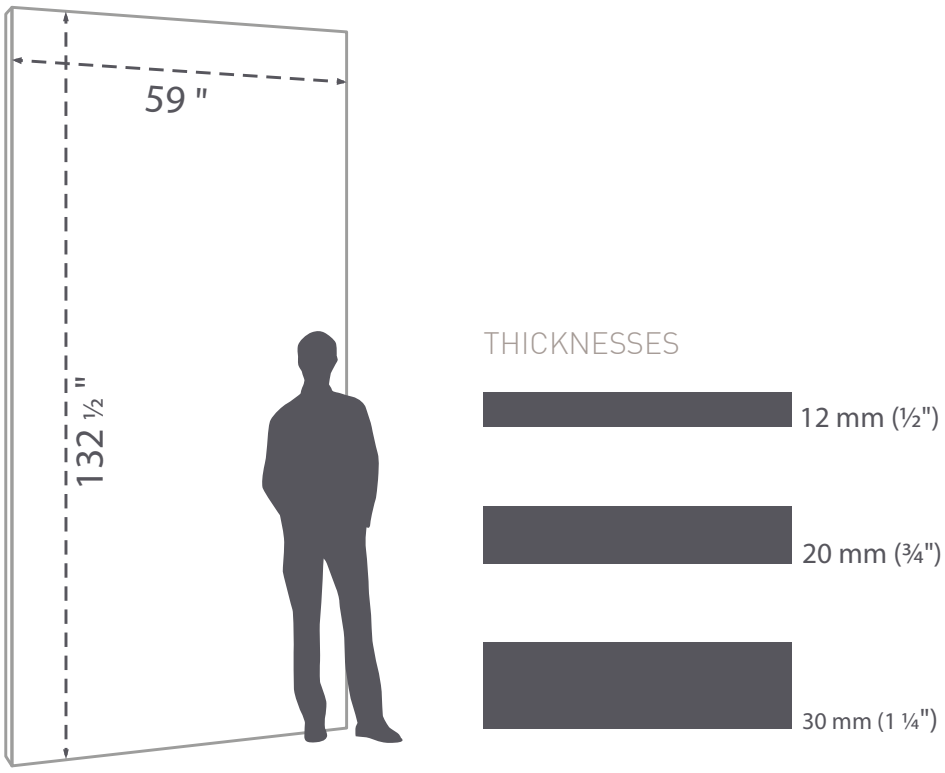
Lapitec® is a sintered stone: an innovative, versatile material offering excellent performance. Resistant to wear, weathering, exposure to UV radiation, heat, frost and water absorption; ideal for interior and exterior coverings.The range of surface finishes make this material perfect for floor and wall coverings.
Lapitec® is compatible with a wide range of adhesives and grouts that allow it to be installed on several types of substrates; it can be used without limitations in a range of different surroundings, including highly aggressive environments (high humidity, salt spray, presence of aggressive pollutants, etc.).

Lapitec® has the following distinguishing features:

- it is isotropic
- it is frost resistant as it is non-porous
- it is scratch resistant as it has a high resistance to deep abrasion
- it is stain resistant as it does not have a porous surface that retains solid and/or liquid deposits*

*Under the microscope, the surface only has 5% of micro depressions with an average size of less than 30 µm and a depth of less than 15 µm. The original inorganic surface of Lapitec® is hydrophobic and oleophobic, properties that prevent liquids depositing at the bottom of the micro depressions, ensuring perfect stain resistance.

1.1.1/ Standard dimensions



The minimum effective guaranteed dimensions for the 30 mm thickness are 3365x1460 mm (surface area of 4.91 m^2).
Note: for the Lithos finish the effective dimensions are 3365x1350 mm (132 ½"x53 3/16in) - surface area of 4.54 m^2 (48.86sqft).

1. PRODUCT

1.1.2/ Range of colours and finishes

ARABESCATO MICHELANGELO


ARABESCATO CANOVA

ARABESCATO PERLA

ARABESCATO DONATELLO

ARABESCATO CORALLO


ARABESCATO BERNINI

ARTICO

BIANCO POLARE

BIANCO CREMA

AVORIO


SAHARA*


AVANA


TABACCO*


PORFIDO ROSSO


MOCA


EBANO


GRIGIO CEMENTO


GRIGIO PIOMBO


NERO ANTRACITE

*special orders

CASABLANCA**

ROMA**


LONDON**


BROOKLYN**

**only available in Urban range finish

FOSSIL:
A course-grained surface finish, with a roughness similar to split stone or flamed natural stone surfaces.

ARENA
A smooth sanded finish, with a regular grain that gives a natural dynamism to th whole slab.

VESUVIO
A structured finish that is soft to the touch - similar to the velvet (leather) finish given to granite.

DUNE
It evokes desert sand, where the wind delicately models the panorama.

SATIN
A silky shine with imperceptible smooth.

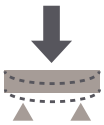
LUX
A polished and highly reflective finish.

LITHOS
A finely textured surface offering muted and natural colours.

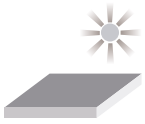
URBAN
A structured finish with a delicate parchment-like roughness, ideal for large flat surfaces.

1. PRODUCT

1.1.3/ Technical specifications

TECHNICAL SPECIFICATIONS	STANDARD	TEST RESULT
 Standard dimensions	EN 14617-16	3365 x 1500 mm 132 ½ x 59 in
 Thicknesses	EN 14617-16	12 - 20 - 30 mm ½ - ¾ - 1 ¼ in
 Density	EN 14617-1	2,4 kg/dm^3 149 lb/ft^3
 Flexural strength	EN 14617-2	43 N/mm^2 6237 lbf/in^2
 Water absorption	ASTM C97	0.03%
 Compressive strength	ASTM C170	483 N/mm^2 70 lbf/in^2
 Impact resistance	EN 14617-9	3.3 Joule sample 3/4 in thickness thickness 3/4 in

1. PRODUCT

TECHNICAL SPECIFICATIONS		STANDARDS	TEST RESULTS
	Deep abrasion resistance	EN 14617-4	1 in
	Frost resistance	EN 14617-5	Resistant
	Fire reaction	EN 13501-1	A1
	Resistance to chemical substance	ASTM C650 Common household and cleaning chemicals	Not damaged
		ASTM C650 Swimming pool chemicals	Not damaged
		ASTM C650 Acid	Not damaged
	Color resistance to light	DIN 51094	No change of colors
	Coefficient of linear thermal expansion	EN 14617-11	6.3 x 10^{-6} °C^{-1}
	Thermal conductivity	EN ISO 10456	1.3 W/m . °K

1. PRODUCT

1.1.4/ Anti-slip properties

ASTM C1028-07 - COF Coefficient of Friction

Finish	Dry	Wet
Satin	0.76	0.61
Vesuvio	-	-
Fossil	0.89	0.94
Arena	1.01	1.03
Lithos	0.82	0.81
Dune	0.72	0.73
Urban	0.90	0.86

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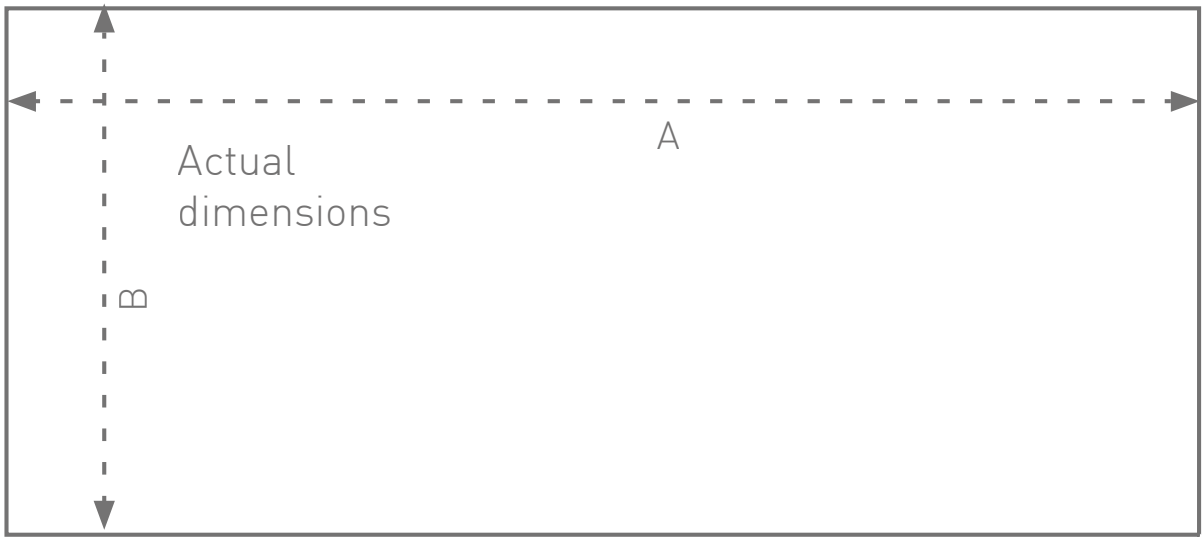
ASTM A137.1 Ver 1. - DCOF Dinamic Coefficient of Friction

Finish	Tile 1	Tile 2	Tile 3
	Average Value		
Satin	0.47	0.49	0.49
Vesuvio	0.50	0.50	0.50
Fossil	0.71	0.71	0.71
Arena	0.81	0.85	0.85
Lithos	0.49	0.52	0.46
Dune	0.42	0.42	0.43
Urban	0.81	0.79	0.81

1. PRODUCT

1.2/ TOLERANCES

1.2.1/ Dimensions and thickness



The minimum effective guaranteed dimensions for the 30 mm thickness are 3365x1460 mm (surface area of 4.91 m^2).
Note: for the Lithos finish the effective dimensions are 3365x1350 mm (132 ½"x53 3/16in) - surface area of 4.54 m^2 (48.86sqft).

Dimensions	Length mm	Width mm
Actual with th. of 12 mm - ½ in	132 ½ (A	59 (B)
Actual with th. of 20 mm - ¾ in	132 ½ (A	59 (B)
Actual with th. of 30 mm - 1 ¼ in	132 ½ (A)	57 ½ (B) (B)

Technical information	M.U.	THICKNESS ½"	THICKNESS ¾"	THICKNESS 1 ¼"
Slab surface	no		54.36	
Slab weight	lb	352.74	573.2	815.71
Weight	ft^2	6	10	15

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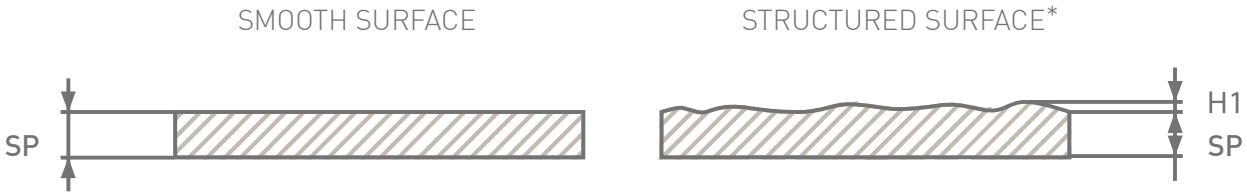
Thickness

Nominal thickness SP	Tolerance mm	H1 mm
12 mm - ½ in	-0/+1 mm - (-0/+1/32 in)	< 3 (⅛")
20 mm - ¾ in	± 0,5 mm - (-0/+1/64 in)	< 3 (⅛")
30 mm - 1 ¼ in	± 0,5 mm - (-0/+1/64 in)	< 3 (⅛")



*STRUCTURED SURFACE: Fossil, Arena, Vesuvio, Dune, Lithos and Urban

Gloss grades

	GLOSS	
Finish	Minimum	Variation on same slab
Lux	> 65	< 10
Satin	< 16	< 3
Vesuvio	< 5	< 3
Fossil	< 5	< 3
Arena	< 5	< 3
Lithos	< 5	< 3
Dune	< 5	< 3
Urban	< 5	< 3

The grade of gloss is measured using a glossmeter on the processed surface. The gloss variation on the same slab is checked by making measurements at the edges and the centre of the slab.

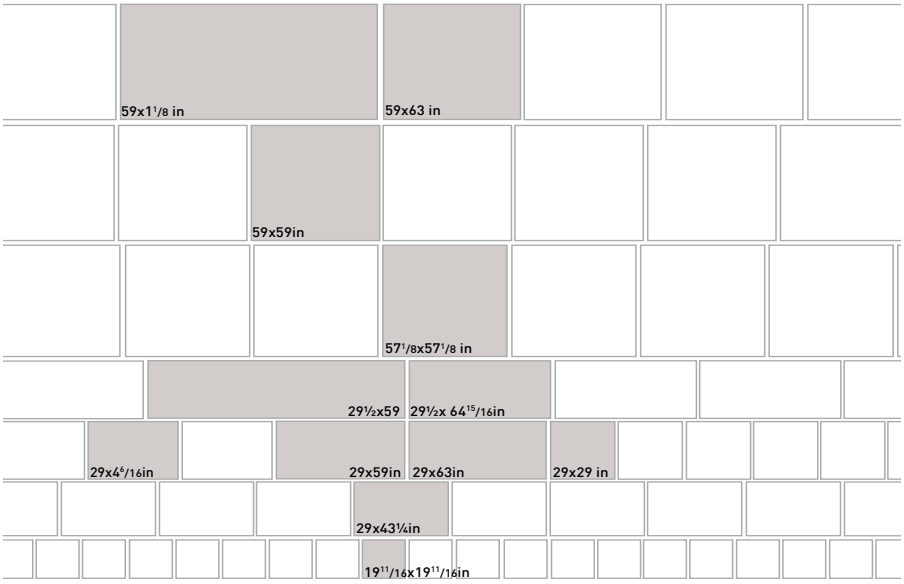
1. PRODUCT

1.2.2/ Modular sizes (Cut to size)

On request, Lapitec® slabs can be supplied in modular sizes that can be used in different combinations, respecting different alignments on the gaps; below we show the sizes for the purposes of design in compliance with factory dimensions.

Before proceeding to install combinations composed of multiple modular sizes, the dimensions must be checked also in consideration of the presence of joints and minimum gap widths (indoor – outdoor).

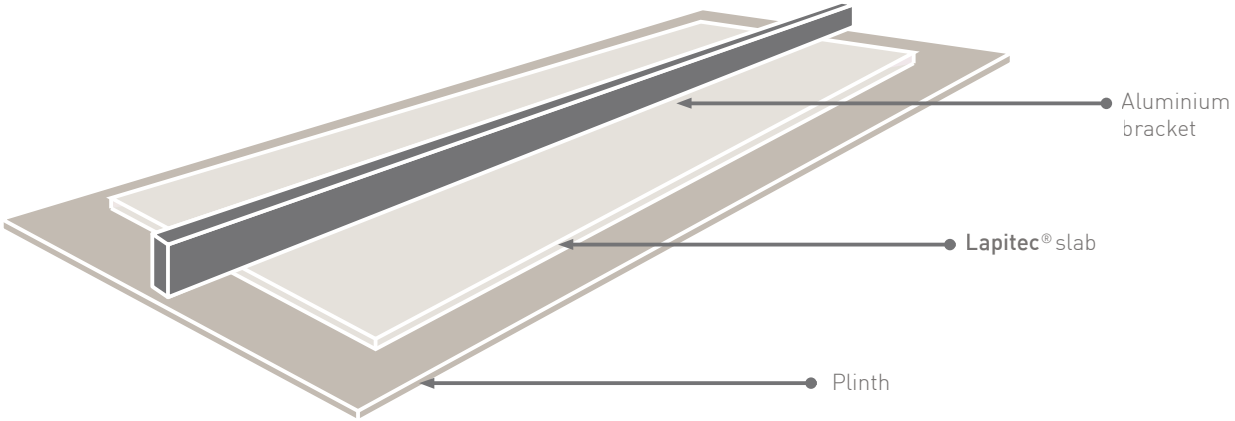
Modular dimensions
1500x3000mm (59x1 1/8 in)
1500x1600mm (59x63 in)
1500x1500mm (59x59in)
1450x1450mm (57 1/8x57 1/8 in)
750x3000mm (29½x59 in)
750x1650 (29½x 64 15/16in)
750x1600mm (29x63in)
750x1500mm (29x59in)
750x1050 (29x41 6/16in)
750x750mm (29x29 in)
700x1100mm (29x43¼in)
500x500mm (19 11/16x19 15/16in)



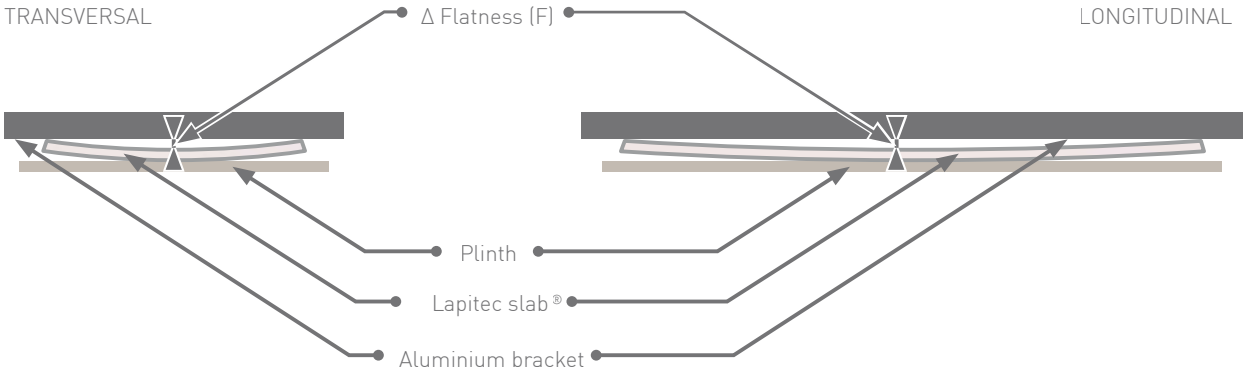
Note: the modular sizes shown are referred only to the 12 (1/2 in) and 20 mm (3/4in) thicknesses. For modular sizes of 30 mm thickness slabs, consult Lapitec S.p.A.

1. PRODUCT

1.2.3/ Flatness



	TRANSVERSAL		LONGITUDINAL	
Thicknesses mm	Width mm	F mm	Length mm	F mm
½ - ¾ - 1 ¼	59	≤ 1/16	132 ½	≤ ⅛



To measure flatness correctly, the slab must be placed on a perfectly horizontal and stable reference surface, i.e. not resting on trestles and not performing measurements on suspended slabs. The flatness is measured with an aluminium bar and feeler gauges at the centre of the sides: 750 mm and 1700 mm.

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1.2.4/ Colour tolerances (coverings)

Conformity of aesthetic features - Vesuvio, Fossil, Arena, Lithos, Dune

Type of non-conformity	Size mm
Different coloured spot	› 0.6
Uneven area	› 3
White grains on a dark background	Acceptable up to 1 mm

Conformity of aesthetic features - Lux and Satin

Type of non-conformity	Size mm
Different coloured spot	› 0.6
Similar coloured spot	› 5
Hole	› 0.6
Uneven area	› 3
Scratch / Shading	If visible at right angles to the slab, from one metre away, in natural light
White grains on a dark background	Acceptable up to 1 mm

Slabs inspection

We advise our customers to carefully clean and inspect the slab before processing it. This procedure guarantees that the material processing is optimised and verifies that all the quality standards have been met.
Tip: this should be standard practice. We will not accept complaints for materials installed with defects that were already there at delivery.

1. PRODUCT

1.3/ ACCESSORIES

1.3.2/ Tools - blades for cutting on the job site

Lapitec® is generally delivered to the job site precut to size and drilled in compliance with the project specification; however, if it is necessary to process the slabs on site, Lapitec S.p.A. supplies and recommends specific tested and guaranteed tools. The approved tools are available from Lapitec S.p.A., which confirms their fitness for purpose. Continuous rim diamond saw blades for manual power tools (grinders, angle grinders, etc.).

Ø 115 mm Ø 22 mm coupling (*) from 11,000 to 13,000 rpm
Ø 125 mm Ø 22 mm coupling (*) from 11,000 to 13,000 rpm
Ø 230 mm Ø 22 mm coupling (*) from 9,000 to 11,000 rpm (*) adapter also available for Ø 20 mm

1.3.3/ Tools - drill bits and hole saws for drilling the slab on the job site

Diamond hole saws for drilling with power tools (drills...)
Ø 06 mm holes HEX drive 1,800 - 2,000 rpm (for drill)
Ø 08 mm holes HEX drive 1,800 - 2,000 rpm (for drill)
Ø 10 mm holes HEX drive 1,800 - 2,000 rpm (for drill)
Ø 12 mm holes HEX drive 1,800 - 2,000 rpm (for drill)
Ø 14 mm holes HEX drive 1,800 - 2,000 rpm (for drill)
Ø 06 mm holes M14 drive 1,800 - 2,000 rpm (for angle grinder)
Ø 08 mm holes M14 drive 1,800 - 2,000 rpm (for angle grinder)
Ø 10 mm holes M14 drive 1,800 - 2,000 rpm (for angle grinder)
Ø 12 mm holes M14 drive 1,800 - 2,000 rpm (for angle grinder)
Ø 14 mm holes M14 drive 1,800 - 2,000 rpm (for angle grinder)
Ø 15 mm holes M14 drive 3,000 - 11,000 rpm (for angle grinder)
Ø 20 mm holes M14 drive 3,000 - 11,000 rpm (for angle grinder)
Ø 25 mm holes M14 drive 3,000 - 11,000 rpm (for angle grinder)
Ø 30 mm holes M14 drive 3,000 - 11,000 rpm (for angle grinder)
Ø 32 mm holes M14 drive 3,000 - 11,000 rpm (for angle grinder)
Ø 35 mm holes M14 drive 3,000 - 11,000 rpm (for angle grinder)
Ø 40 mm holes M14 drive 3,000 - 11,000 rpm (for angle grinder)
Ø 50 mm holes M14 drive 3,000 - 11,000 rpm (for angle grinder)
Ø 60 mm holes M14 drive 3,000 - 11,000 rpm (for angle grinder)
Ø 68 mm holes M14 drive 3,000 - 11,000 rpm (for angle grinder)

CONSTRUCTION:
Interior floor and cladding

LAPITEC®:
Bianco Crema, Satin finish

2. MACHININGS

2.1/ INTRODUCTION

Lapitec® is a sintered stone: a prestigious material that, like precious stone products, is supplied to the job site already prepared for installation (cut, drilled and machined).

Properly executed design and high precision measurements make it possible to perform the preparatory work in the factory, thus avoiding the need for critical adjustments on the job site.

If it is anyway necessary to make adjustments, Lapitec S.p.A. advises the user that all the prescriptions given in this manual must be complied with in full.

If any type of machining process is required, it is good practice to carry out preliminary trials of cutting and drilling operations in order to become familiar with the procedure and avoid problems.

The company can provide offcuts of material for this purpose on request.

Machining operations on Lapitec® must always be carried out using suitable personal protective equipment (PPE) for the safety of the user.

2. MACHININGS

2.2/ WORKPLACES (JOB SITES)

The slabs are packed on supports and/or in crates. Single slabs must be transported with caution and stacked edgewise, regardless of the sizes, taking care to place materials between the slabs and between the slabs and support to prevent breakages (e.g. timber battens). The slabs must always be adequately supported to avoid flexure and they must be stored in places where they are not subject to possible impact damage (avoid areas subject to traffic or manoeuvres).

If the slabs are to be stored outdoors they must always be protected from rain by a tarpaulin to avoid water collecting on the surfaces. If the slabs get wet in their packing, remove the packing materials completely and position the slabs in such a way that they can dry out completely.

2. MACHININGS

2.3/ HANDLING AND LIFTING

2.3.1/ Manual handling

Any size exceeding 25 kg in weight (9.14sqft/½" , 5.38sqft/¾", or 3.22sqft/1 ¼") and, more in general, any long components, must be handled by two operators. The slabs must be carried edgewise to avoid flexure; operators must use caution to avoid impact damage to the edges or surface of the Lapitec slabs®. If the slabs are inadvertently subjected to impact, the operators must check them to ensure they have not been damaged. Any breakage can impair the performance of the slab once it has been installed and subjected to the stresses associated with the application.

Lapitec® must always be handled by operators wearing gloves to prevent possible cuts to the hands and/or soiling of the slab surface.

2.3.2/ Handling using lifting machinery

Before proceeding always check the maximum load capacity of the lifting equipment.

Each single slab can be handled using rubber-coated web slings, rubber-coated grippers or suction cups. Slabs with a "Arena", "Dune", "Vesuvio" or "Fossil" finish however should not be lifted using suction cups. Chains or steel ropes must not be used under any circumstances, as they can damage the material.

When lifting a single slab, we recommend that the gripper is positioned at the centre of the slab to balance the weight and limit oscillations (as shown in figure 1). When a slab is handled with the gripper, make sure there are no voids between the newly installed slab and the substrate (may be another slab or other type of surface).

When lifting multiple slabs we advise using a spreader beam and webbing straps, with a wooden spacer that is slightly longer than the pack of slabs, underneath and at the top of the slabs (as shown in figure 2).

Lapitec® must always be handled by operators wearing gloves to prevent possible cuts to the hands and/or soiling of the slab surface.

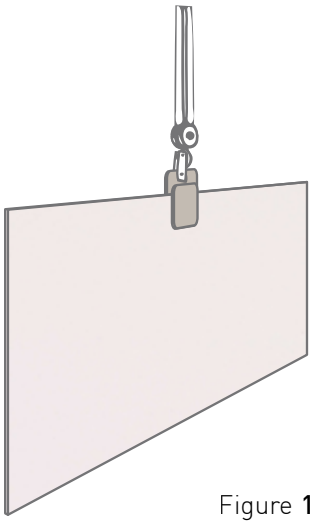


Figure **1**

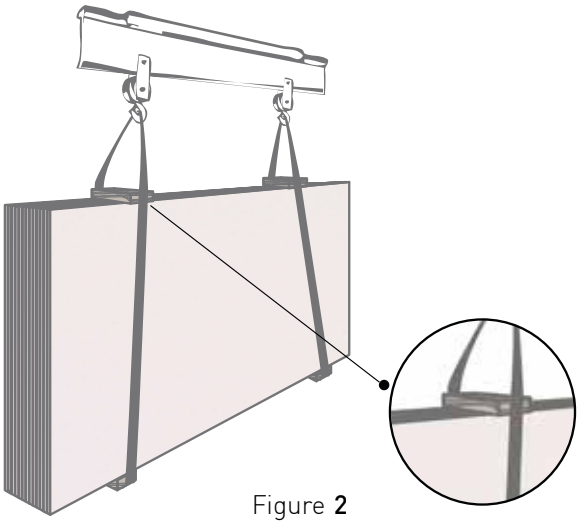
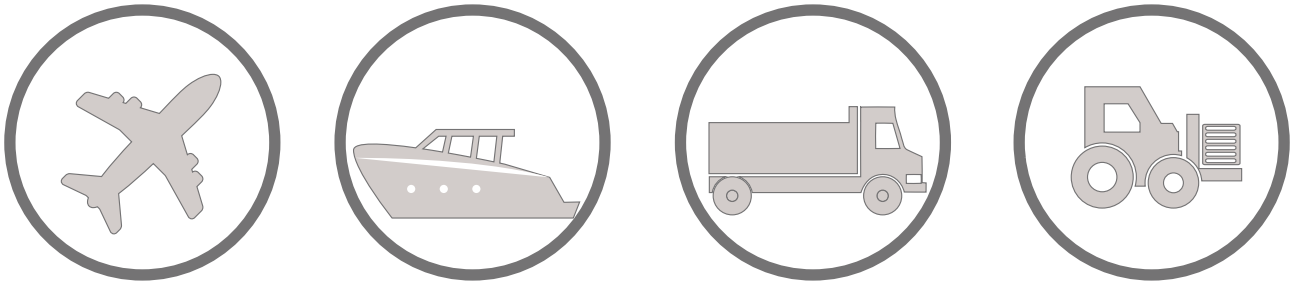


Figure **2**

2. MACHININGS

2.4/ TRANSPORTATION AND STORAGE



During transport and storage in a warehouse or on the job site, Lapitec® slabs must be placed on suitable supports or metal structures such as trestles or dedicated shelving. The supports in question must be in good condition and appropriately treated to prevent the emergence of oxidation phenomena that could foul the surface of the slabs.

It is also necessary to provide and install suitable wood, rubber or plastic protections to prevent impact on the edges of the slabs or scuffing of the surface, during transport, handling and storage of the material.

If using plastic elements to separate or protect the slabs, avoid direct exposure to heat sources or prolonged periods of exposure to direct sunlight.

Lapitec® is impervious to weathering and can be stored outdoors, but if water is allowed to accumulate on the surfaces or edges of the slabs (rain, snow or condensate) this can result in the formation of hard-to-remove water stains. If slabs must be stored outdoors for prolonged periods, cover them with a tarpaulin.

2. MACHININGS

Packaging

Wooden bundles: standard packaging for container shipment.
A-frames clad in wood: provided by the customer for shipping by road.
Non-standard packaging : for material supplied cut to size. The packaging is chosen according to the format, either crates or pallets.
The values indicated below are merely illustrative

Technical information	M.U.	**THICKNESS ½"** Values	**THICKNESS ¾"** Values	**THICKNESS 1 ¼"** Values
Delivery		FCA - Lapitec S.p.A. Vedelago (TV) ITALY		
Slab surface	m^2	5.05	5.05	4.91
Slab weight	**kg**	**160**	**260**	**370**
Weight per m^2	**kg**	**29**	**48**	**72**
Slabs per bundle	no.	20 - 18*	12 - 11*	8 - 7*
m^2 per bundle	m^2	101	60.6	40.4
Weight of wooden bundle	kg	Approx. 80		
Weight of complete bundle	kg	Approx. 3,300		
Bundle dimensions including packaging	mm	3,420 x 350 h 1,600		

* The change in the number of slabs per bundle is due to the difference in thickness of the chosen finishes.

The **Lapitec®** slabs are packed with the machined surfaces protected by a polyethylene film. The carrier must adequately secure the material during loading.

Truck
Load: 14,000 kg

Technical information	M.U.	**THICKNESS 12 mm** Values	**THICKNESS 20 mm** Values	**THICKNESS 30 mm** Values
Total slabs loadable	no.	87	53	37
Total weight with packaging	kg	13,990	13,850	13,760
total m^2	m^2	439.35	267.65	186.85

Truck and trailer
Load: 24,000 kg

Technical information	M.U.	**THICKNESS 12 mm** Values	**THICKNESS 20 mm** Values	**THICKNESS 30 mm** Values
Total slabs loadable	no.	149	91	64
Total weight with packaging	kg	23,980	23,800	23,820
total m^2	m^2	752.45	459.55	323.20

2. MACHININGS

Container 20' box
Load: 21,000 kg

Technical information	M.U.	**THICKNESS 12 mm** Values	**THICKNESS 20 mm** Values	**THICKNESS 30 mm** Values
Total bundles loadable	no.	6	6	7
Total slabs per container	no.	120 - 108*	72 - 66*	48 - 42*
Total weight with packaging	kg	Approx 19,800		
total m²	m²	606.00 - 545.40	363.60 - 333.3	242.40 - 212.1

Container 20' box
Load: 24,000 kg

Technical information	M.U.	**THICKNESS 12 mm** Values	**THICKNESS 20 mm** Values	**THICKNESS 30 mm** Values
Total bundles loadable	no.	7	7	7
Total slabs per container	no.	140 - 126	84 - 77	56 - 49
Total weight with packaging	kg	Approx 23,100		
total m²	m²	707.00 - 636.3	424.20 - 388.85	282.80 - 247.45

** When organising a container, consider the weight limits imposed by the destination port

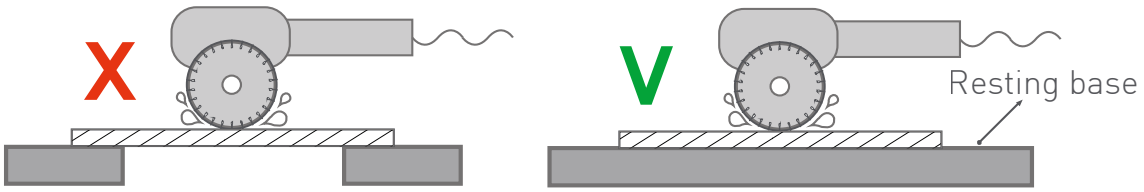
2. MACHININGS

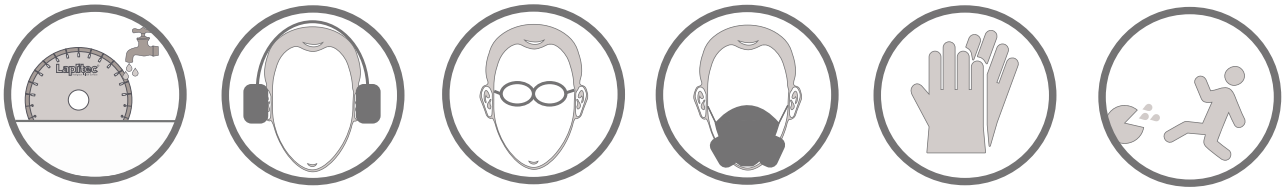
2.5/ CUTTING ON THE JOB SITE

The slabs are generally delivered pre-cut, both in modular form or cut to measure; if you need to cut the slabs on the job site proceed using the tools recommended by Lapitec S.p.A. or, alternatively, tools that are fully equivalent to the recommended tools. The prescriptions in this manual are referred exclusively to manual cutting operations. For machining operations (sawing, waterjet cutting or CNC machining) refer to the technical manual available at www.lapitec.it.

Caution: During any manual machining operation the slabs must be adequately supported. The substrate must be sufficiently rigid, perfectly flat and in good condition. A timber support is to be preferred to a metal support to avoid scratches on the Lapitec® surface due to rubbing friction. All machining work must be performed starting from the finished surface and working towards the unfinished side.

Use cutting tools with plenty of water to cool the blade and eliminate machining dust. Do not attempt dry-cutting of the slabs. Once the cut has been completed, lightly smooth the upper and lower edges of the cut with 60/120 grit glass paper. This will eliminate splinters and reduce the likelihood of cuts (due to the hardness of the material, the live edges of cut Lapitec® tend to be extremely sharp).





2. MACHININGS

Finish for top and edge - LUX

Supplier	Tool	Sequence adopted
Sanwa - Kenma (Alpha Tools)	Dia Ceramica - former Ceramica Series	150R - 300R - 500R - 1000R - 2000R - 3000R
Weha	Es Wet Use - former Series - Hybrid Flash	1 - 2 - 3 - 4 - 5 - 6 - 7 50 - 100 - 200 - 400 - 800 - 1500 - 3000 H1 - H2 - H3
Italdiamant	Ds Series	50 - 100 - 200 - 400 - 800 - 1500 - 3000

Finish for top and edge - SATIN

Supplier	Tool	Sequence adopted
Sanwa - Kenma (Alpha Tools)	Dia Ceramica - TF Ceramic Series	150R - 300R - 500R*
Weha	Es Series - Hybrid Flash	50ES - 100ES - 200ES - 400ES - 800ES* H1 - H2
Italdiamant	Ds Series	50 - 100 - 200 - 400 - 800*

*Optional

2. MACHININGS

2.6/ DRILLING ON THE JOB SITE

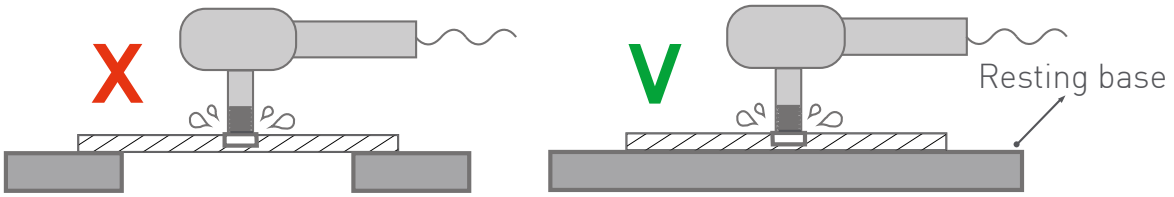
If you need to make holes in the slab (penetration of pipes or cables, ventilation holes, etc.) Lapitec® can be drilled using the tools shown below and adopting the prescribed methods.

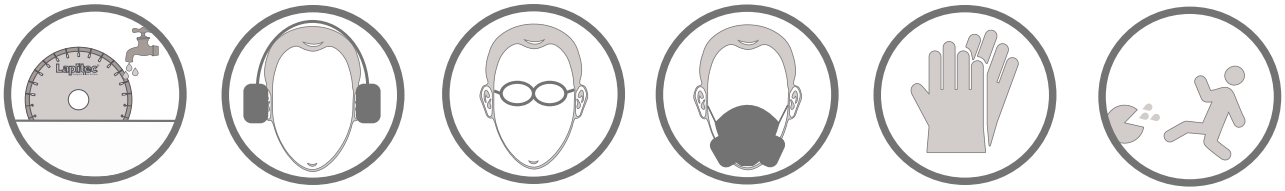
The part to be drilled must be adequately supported as in the case of cutting operations; during drilling avoid any type of hammer action to avoid the risk of breaking the slab.

To drill the slab use water to cool the tool and eliminate machining dust. Do not attempt dry-cutting of the slabs.

Caution: holes must be drilled starting from the finished surface and proceeding towards the unfinished side of the slab.

Supplier	Tool
Alpha Tools	Wet core Drill series
Weha	Ceramic line, Drymagic
Italdiamant	EvoGres Series





2. MACHININGS

1.3/ ACCESSORIES

1.3.1/ Bio-Care

Bio-Care is a technological solution whereby Lapitec® is given a full-body Titanium Dioxide (TiO_2) treatment during the production process. This is an exclusive process that imparts antibacterial and self-cleaning properties to the material. The functions of Bio-care can be regenerated by applying the Bio-Care kit; this operation can be performed on exposed parts of the slab whenever the material is machined (holes, surface machining and cuts).

Failure to apply the Bio-Care treatment can inhibit the action of the Titanium Dioxide (TiO_2) and impair the qualities of Lapitec®. The Bio-Care kit comprises two products to be used one after the other: an adhesion promoter (Bio-Care A) and a complex that reactivates the Titanium Dioxide (TiO_2) present in the body of the slab (Bio-Care B).

How to apply

Make sure that the surface is clean, dry and dust-free. Spread Bio-Care A evenly on the surface using a solvent-resistant cloth, then wait for approx. 60 seconds until the surface is completely dry Using a new solvent-resistant cloth, apply a small amount of Bio-Care B to the whole surface to be treated. Take care to spread the product uniformly. When the product is more viscous (because of the evaporation of most of the solvent after 5 minutes), remove the excess Bio-Care B with a clean cloth, taking care to remove stains or shadows.

Warning: any shadow or stain left on the surface will become permanent after the treatment has completely set.

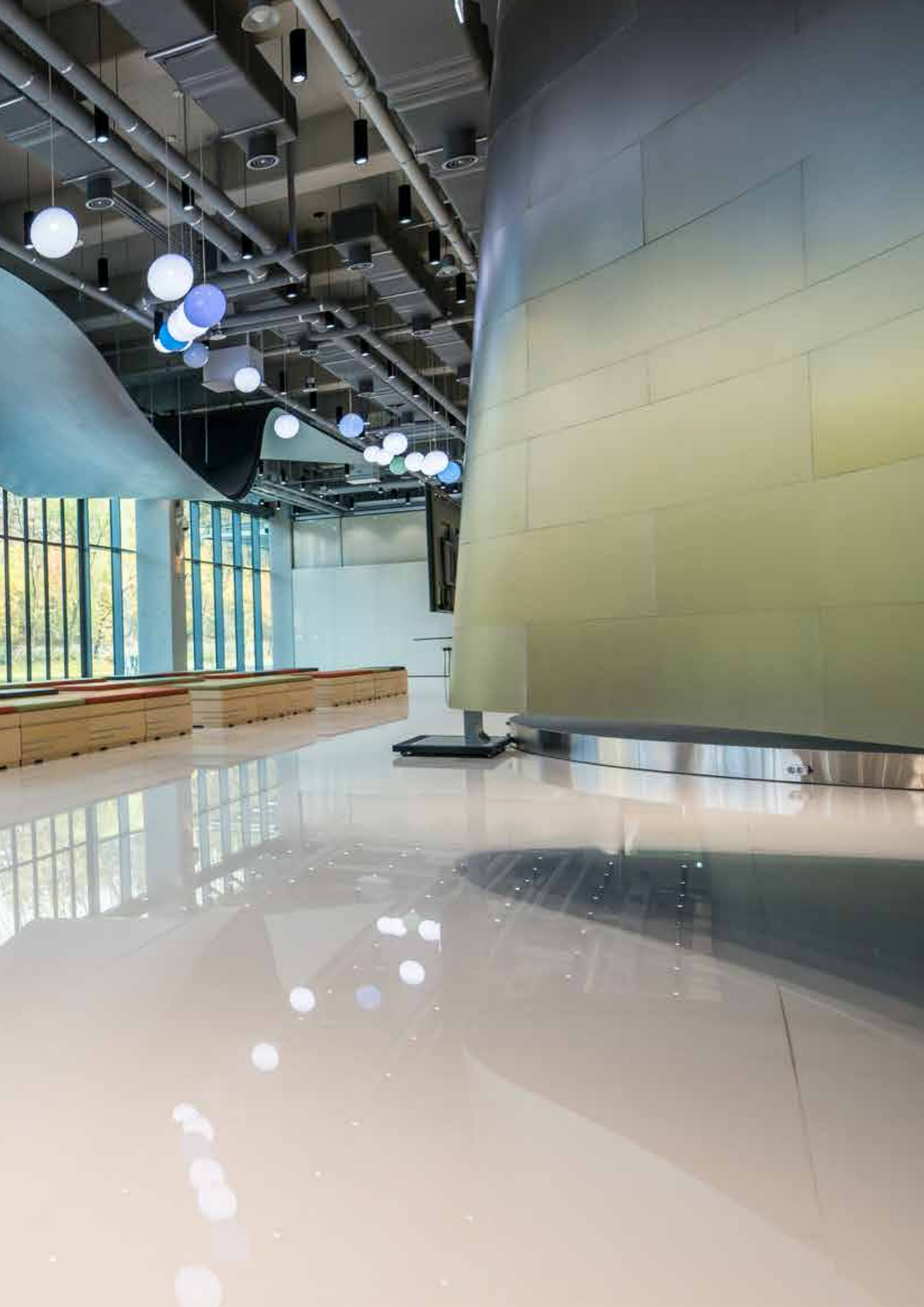
Treatment	Quantity g/m^2	Workpiece can be handled after
Bio-Care A	5-6 g/m^2	60 s
Bio-Care B	5-6 g/m^2	40 min

The treated surface can be handled from 40 minutes after application of the kit; wait 7 days for complete activation of the treatment and the execution of tests, if required. The treatment may be applied manually on small surfaces. On slabs, the treatment must be applied using dedicated machinery. As the amount of product is minimal, we recommend applying Lapitec® Bio-Care to several workpieces to be treated in sequence.

Warning: do not turn upside down, keep in a cool, dry place well away from heat sources.

CONSTRUCTION:
Interior floors

LAPITEC®:
Bianco Crema, Lux finish



3. GENERAL PRESCRIPTIONS FOR USE

3.1/ INTRODUCTION

Irrespective of the place in which Lapitec® is to be installed, the designer and installer must make sure that certain substrate characteristics are present: if any of the specified conditions is missing the material must not be installed.

3.2/ GENERAL REQUIREMENTS FOR SUBSTRATES

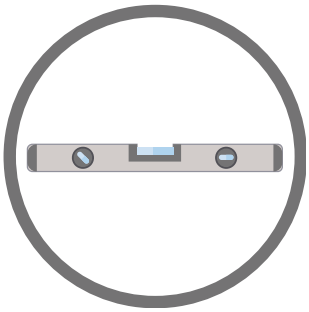
Compactness

The substrate must be compact and uniform in such a way as to ensure that no material becomes detached through time due to loss of cohesion within the substrate. Proceed to perform a check using a manual inspection by striking various parts of the surface and making light incisions.

When tapped, the surface must not emit dull sounds indicating the presence of voids or areas of de-cohesion in the depth of the support. The surface must not produce dust or be subject to flaking around scoring lines.
Finally, the surface must be free of cracks, gaps, areas of swelling, voids/holes, etc.

Any defects could impair the performance of the adhesive through time and lead to detachment of the Lapitec® slabs from the substrate.

Co-planarity



Dimensional consistency (surface) test in compliance with UNI 11493:2013

- Adhesive to thickness ≥ 5 mm (3/16") with tolerance of approximately 2 mm (3/32") permitted over span of 2 meters (78 3/4")
- Adhesive to thickness ≤ 5 mm (3/16") with tolerance no greater than 1.5 mm (1/16") with respect to a 2 meters (78 3/4") screed board

Caution: substrates that do not comply with the specified tolerances must be finished with levelling layers (floors) or smoothing layers (walls). Failure to comply with this criterion could negatively impact the lifetime of the Lapitec® covering

3. GENERAL PRESCRIPTIONS FOR USE

Curing

The substrate on which Lapitec® is to be installed must be fully cured. Before installing the material check that the substrate shows no signs of shrinkage due to the curing process and that it has not released water/solvents as its components dry out (bedding layer, screed, self-levelling layer, plaster, etc.). Compliance with the required curing times will forestall problems of cracking that could result in damage to the covering.

This principle is particularly important in the case of cementitious substrates. In general, concrete substrates will require up to six months to become stable in terms of dimensions; renders or cement screed will take around 28 days; the values are however guideline and can be significantly affected by environmental conditions.

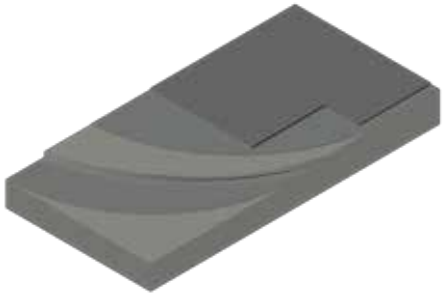
Cleaning the surface

Before laying the covering, the substrate must be cleaned; dust, oil, grease and grime must be removed using manual cleaning tools or detergents. The properties of adhesives can be greatly compromised if they are used on a contaminated surface. In the case of substrates already having coverings (e.g. tiled surfaces), check adhesion of the existing covering to the substrate and ensure the surface is thoroughly cleaned.

3. GENERAL PRESCRIPTIONS FOR USE

3.3/ SPECIFIC REQUIREMENTS

3.3.1/ Cement screeds

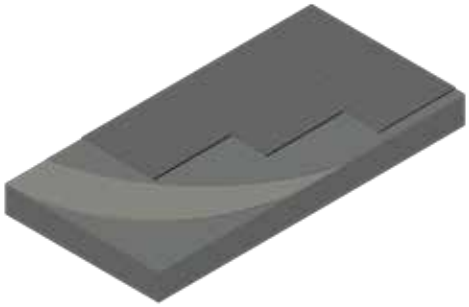


In the case of screeds the substrate must guarantee mechanical strength in compliance with statutory legislation for the various different applications. Check to be performed by the designer or a qualified professional person. The material can be installed no sooner than 3 weeks after laying of the screed. The surface of the substrates must be dry. Measurement of the degree of humidity must be carried out with a calcium carbide type moisture analyser.

The maximum permissible percentage of moisture is:
3% for CT class screeds (cement based), both indoor and outdoor

In the case of outdoor substrates, ensure they are protected from rainfall before the slabs are installed.

3.3.2/ Lightweight screeds (anhydrite screeds)



In the case of lightweight screeds always refer to the indications of the system producer; before laying Lapitec slabs the surfaces must be sanded, free of dust, and perfectly dry. Measurement of the degree of humidity must be carried out with a calcium carbide type moisture analyser.

The maximum permissible percentage of moisture is:
0.5% for CA class screeds

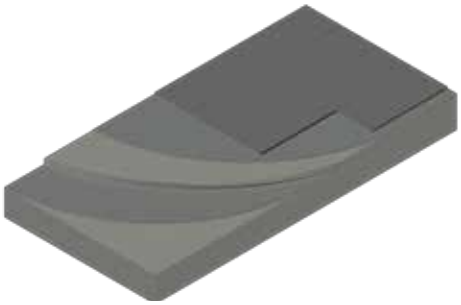
Self-levelling cement screeds cannot be installed on top of lightweight screeds.

3. GENERAL PRESCRIPTIONS FOR USE

3.3.3/ Heated screeds

Before proceeding to lay the Lapitec material, be sure to wait at least 14 days from the time the screed was installed and after having tested the system as prescribed by EN 1264-4 (test conducted by bringing the system to a temperature of between 20° and 25° for at least 3 days and thereafter at the maximum operating temperature, to be maintained for at least 5 days, after which the system is allowed to cool to ambient temperature). The covering can be grouted 8 days after the installation of Lapitec® and it can be used after a minimum of 6 days from the time of grouting. Measurement of the degree of humidity must be carried out with a calcium carbide type moisture analyser.
The maximum permissible percentage is:
0.3% for screeds with a heated substrate

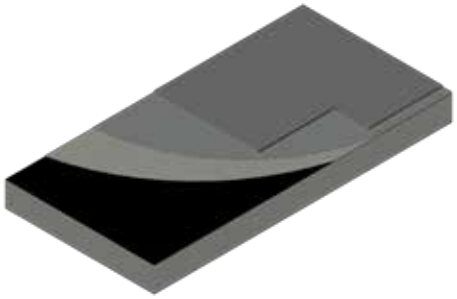
3.3.4/ Concrete poured in situ



Install the covering on concrete substrates only after the required drying times in accordance with the thickness of the substrate and its composition The substrate must not be treated with substances that could impact negatively on adhesion of the fixing products (mould treatments, resins, vapour barriers, etc.).

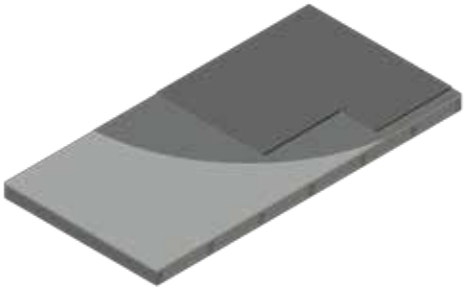
3. GENERAL PRESCRIPTIONS FOR USE

3.3.5/ Waterproofing



The slabs may be installed on substrates containing a cement based waterproofing agent; in all cases, adhere to the instructions of the producer of the adhesive used for this purpose. For all other cases always consult the adhesive producers to establish whether or not the material can be installed.

3.3.6/ Substrates made of fibre-reinforced backer boards



In the case of substrates made of fibre-reinforced backer boards (fibre cement, gypsum fibreboard, etc.) always refer to the instructions of the system producer; before installing the Lapitec slabs the surfaces must be perfectly co-planar (maximum permissible tolerance of joins between boars is 0.8 mm - < 1/32"), dust-free, perfectly dry and correctly fixed to the substrate. Drywall systems must be able to support a cladding load of up to 40 kg/m2.

3. GENERAL PRESCRIPTIONS FOR USE

3.3.7/ Plasterboard substrates

In the case of substrates made of plasterboard, always comply with the indications provided by the drywall system producer. Single board systems are not permitted and the system must be able to support a cladding load of up to 40 kg/m$^{2.}$

If using boards without rebated edges, adjacent boards must be perfectly co-planar (maximum permissible board-to-board tolerance of 0.8 mm - **<** $^{1}/_{32}$"**)**.

3. GENERAL PRESCRIPTIONS FOR USE

3.3.8/ Renders

Lapitec® can be installed only on cement renders with bond strength higher than 0.7 N/mm^2 indoors and 1 N/mm2 outdoors.

3.3.9/ Façades

Lapitec® can be installed on façades (heights greater than 2.5 m - 98 $^7/_{16}$") exclusively when the following conditions are complied with:

- the substrate must provide pull-off resistance **>** 1 N/mm^2. If the substrate is itself bonded to another layer, the underlying layer must guarantee the same level of pull-off resistance;

- the substrate must guarantee resistance to parallel stresses **≥** 1.2 N/mm2 (UNI 10827);

- if the substrate does not comply with the specified requirements, the use of reinforcing systems (meshes) is permitted;

- the material must not be installed directly on non-rendered substrates (construction blocks, air bricks, etc.);

- in the case of large size slabs (long side **>**60 cm - 2 ft) adopt double buttering techniques and mechanical safety systems.

In the case of slabs exposed to high levels of tension generated by thermal-hygrometric variations, consult the Lapitec S.p.A. technical department for a joint feasibility study.

The feasibility study must also be extended to include the producer of the adhesives.

3. GENERAL PRESCRIPTIONS FOR USE

3.4/ CHOICE OF ADHESIVES

The choice of adhesive must always be correlated with the type of substrate, the application (stresses) and the available time-scale for completion of the work.

In general, the cementitious adhesives recommended in this manual cover almost all needs, while reactive adhesives can be used in the case of special installation conditions.

The choice must anyway be made using one of the products shown in this manual or any alternative product that has identical characteristics to the recommended products.

As a generic indication concerning the intended and permitted use of Lapitec®, the following two tables provide details of floor and wall applications, subdivided by type of use and indoor or outdoor environments.

3. GENERAL PRESCRIPTIONS FOR USE

LAPITEC FLOOR COVERING | INDOOR INSTALLATION:

SUBSTRATE		Residential			Public commercial spaces Pedestrian traffic			Industrial commercial spaces Vehicular traffic		
		≤90 cm (35 7/16")	≤120 cm (47 1/4")	>120 cm (47 1/4")	≤90 cm (35 7/16")	≤120 cm (47 1/4")	>120 cm (47 1/4")	≤90 cm (35 7/16")	≤120 cm (47 1/4")	>120 cm (47 1/4")
Cement screed	with heating	C2	C2S1/S2	C2S1/S2	C2	C2S1/S2	C2S1/S2	/	/	/
	without heating	C2	C2	C2	C2	C2	C2	C2	C2 C2S1/S2	C2 C2S1/S2
Sulphate based screed (anhydrite)	with heating	C2	C2S1/S2	C2S1/S2	C2	C2S1/S2	C2S1/S2	/	/	/
	without heating	C2	C2	C2	C2	C2	C2	/		
Concrete	cast in situ	C2	/	/	C2	C2	C2	C2	C2	C2
	prefabricated	C2 C2S1/S2	/	/	C2 C2S1/S2	/	/	C2 C2S1/S2	/	/
Acoustic insulation layers		on request			on request			not envisaged		
Preformed panels		on request			C2	C2S1/S2	C2S1/S2	not envisaged		
Waterproofing	membrane in sheets	on request			on request			on request		
	liquid non-cement products	on request			on request			on request		
	liquid cement products	C2	C2	C2	C2	C2	C2	C2	C2	C2
Existing substrates with organic adhesive residues (carpeting)		C2	C2 C2S1/S2	C2 C2S1/S2	C2	C2S1/S2	C2S1/S2	C2	C2S1/S2	C2S1/S2
Tiles/mosaic/existing stone surfaces		C2	C2	C2	C2	C2	C2	C2	C2	C2
Existing parquet		on request			on request			/		
Existing resilient flooring		on request			on request			on request		
Existing resin flooring		on request			on request			on request		
Existing metal flooring		R1-R2	/	/	R1-R2	/	/	R1-R2	/	/

3. GENERAL PRESCRIPTIONS FOR USE

LAPITEC FLOOR COVERING | OUTDOOR INSTALLATION:

SUBSTRATE		Residential - public - commercial - industrial		
		≤90 cm (35 7/16")	≤120 cm (47 1/4")	>120 cm
Cement screed	with heating	/	/	/
	without heating	C2	C2 C2S1/S2	C2 C2S1/S2
Sulphate based screed (anhydrite)	with heating	/	/	/
	without heating	/	/	/
Concrete	cast in situ	C2	C2 C2S1/S2	C2 C2S1/S2
	prefabricated	C2 C2S1/S2	/	/
Acoustic insulation layers		/	/	/
Preformed panels		/	/	/
Waterproofing	membrane in sheets	on request		
	liquid non-cement products	on request		
	liquid cement products	C2	C2	C2
Existing substrates with organic adhesive residues (carpeting)		/	/	/
Tiles/mosaic/existing stone surfaces		C2	C2	C2
Existing parquet		/	/	/
Existing resilient flooring		/	/	/
Existing resin flooring		/	/	/
Existing metal flooring		R1-R2	/	/

3. GENERAL PRESCRIPTIONS FOR USE

LAPITEC WALL COVERING | INDOOR INSTALLATION:

SUBSTRATE		Residential			Public commercial			Industrial		
		≤90 cm (35 7/16")	≤120 cm (47 1/4")	>120 cm (47 1/4")	≤90 cm (35 7/16")	≤120 cm (47 1/4")	>120 cm (47 1/4")	≤90 cm (35 7/16")	≤120 cm (47 1/4")	>120 cm (47 1/4")
Lime/cement render	with heating	C2	C2S1/S2	C2S1/S2	C2	C2S1/S2	C2S1/S2	C2	C2S1/S2	C2S1/S2
	without heating	C1	C2	C2	C1	C2	C2	C1	C2	C2
Gypsum/anhydrite	with heating	/	/	/	/	/	/	/	/	/
	without heating	/	/	/	/	/	/	/	/	/
Concrete	cast in situ	C2	C2	C2	C2	C2	C2	C2	C2	C2
	prefabricated	C2	C2	C2	C2	C2	C2	C2	C2	C2
Tiles/mosaic/existing stone surfaces		C2	C2	C2	C2	C2	C2	C2	C2	C2
Waterproofing	membrane in sheets	on request			on request			on request		
	liquid non-cement products	on request			on request			on request		
	liquid cement products	C2	C2	C2	C2	C2	C2	C2	C2	C2
Cement/fibre cement based panels		C1	C2S1/S2	C2S1/S2	C1	C2S1/S2	C2S1/S2	C1	C2S1/S2	C2S1/S2
Wood panels		C2	/	/	C2	/	/	C2	/	/
Plasterboard sheets		C2	/	/	C2	/	/	C2	/	/
Existing metal surfaces		R1	/	/	R1	/	/	R1	/	/
Thermal insulation/sound insulation panel		C2	C2S1/S2	/	C2	C2S1/S2	/	C2	C2S1/S2	/

3. GENERAL PRESCRIPTIONS FOR USE

LAPITEC WALL COVERING | OUTDOOR INSTALLATION:

SUBSTRATE		Residential - public - commercial - industrial		
		≤90 cm (35 7/16")	≤120 cm (47 1/4")	>120 cm (47 1/4")
Lime/cement render	with heating	/	/	/
	without heating	C2-C2S1/S2	C2S1/S2	C2S1/S2
Gypsum/anhydrite	with heating	/	/	/
	without heating	/	/	/
Concrete	cast in situ	C2-C2S1/S2	C2S1/S2	C2S1/S2
	prefabricated	C2-C2S1/S2	C2S1/S2	C2S1/S2
Tiles/mosaic/existing stone surfaces		R1	R2	/
Waterproofing	membrane in sheets	on request		
	liquid non-cement products	on request		
	liquid cement products	C2	C2	C2
Cement/fibre cement based panels		C2-C2S1/S2	not envisaged	/
Wood panels		/	/	/
Plasterboard sheets		/	/	/
Existing metal surfaces		R2	R2	/
Thermal insulation/sound insulation panel		/	/	/

3. GENERAL PRESCRIPTIONS FOR USE

3.5/ CHOICE OF GROUTS

The choice of grouts must always be made in accordance with the width of the gaps and the specific application (stresses).

The aesthetic choice (colour) is to be made by the designer; if the choice is for a grout that contrasts with the colour of the slabs, take care to assess the finished result carefully before proceeding to install the material.

In this context, it must be considered that some grouts are extremely tough and although they can be removed from the surface of Lapitec slabs they may leave unsightly stains on certain types of finishes. In the case of contrasting colours such stains would remain visible, thus negatively affecting the final aesthetic effect of the job.

The choice must anyway be made using one of the products shown in this manual or any alternative product that has identical characteristics to the recommended products.

CONSTRUCTION:
Interior floors

LAPITEC®:
Bianco Polare, Lux finish

4. ADHESIVES AND GROUTS

4.1/ INTRODUCTION

Lapitec® is installed using a broad range of products designed to guarantee performance of the material in its intended uses. To prepare this manual Lapitec S.p.A. worked with several top companies with the aim of identifying, jointly, the most suitable systems for the various applications. In the choice of an installation solution it is essential to define the characteristics of the substrates, identifying an adhesive that is suitable for the application and proceeding with the installation work in compliance with all the instructions provided. Lapitec S.p.A. advises users to consult the adhesives producer at all times and to obtain the latest documentation, complying with all the prescriptions contained therein.

4. ADHESIVES AND GROUTS

4.2/ CLASSIFICATIONS

ADHESIVES

Harmonised standard EN 12004 contains a classification of adhesives for ceramics and for stone products and identifies the applications, making a distinction by chemical nature between:
C: Cementitious adhesive
D: Dispersion adhesive
R: Reaction resin adhesive
The adhesives identified for the use of Lapitec® are cementitious and reactive.

Cementitious adhesive

Powder mixture of hydraulic binding agents, aggregates and organic additives to be mixed with water (one-component) or liquids with polymer additives (two-component)

C1: Normal cementitious adhesive
C2: Cementitious adhesive with improved characteristics (double mechanical characteristics compared to C1)
F: Fast-setting cementitious adhesive

T: Adhesive with reduced slip
Suitable for wall cladding applications
E: Adhesive with extended open time
Material can be laid up to 30 minutes from the time of adhesive spreading
S1: Deformable adhesive (EN 12002)
S2: Highly deformable adhesive (EN 12002)

Reaction resin adhesive

Mixture of synthetic resins, mineral fillers and organic additives.
R1: Normal reaction resin adhesive
R2: Reaction resin adhesive with improved characteristics (capable of withstanding immersion and thermal shock).
Excellent ability to compensate for deformation of the substrate without giving rise to detachment of the covering

GROUTS

Standard EN 13888 defines the classification of grouts.
Definition by chemical type and specifications:
CG1: Cementitious grout
CG2: Cementitious grout with improved characteristics (supplementary characteristics **Ar and W**)
RG: Reaction resin grout
Ar: High abrasion resistance
W: Reduced water absorption
The grouts used with Lapitec® are of the cementitious and reactive type.

NOTE: when a grout is to be used the colour must first be selected: if the colour chosen is different from the colour of the Lapitec slabs®, always refer to the information given by the grout producer concerning aesthetic results

4. ADHESIVES AND GROUTS

4.3/ ADHESIVES PRODUCERS

All producers shown in this manual have tested Lapitec® to assess the possibility of using the material with their adhesives and of finishing the Lapitec surface with their grouts, assessing the fitness for use in different application conditions. All tests were conducted in compliance with the applicable standards in force.

The test results can be supplied on request. Lapitec S.p.A. has contacted several producers to ensure its customers have the widest possible choice in terms of fitness for use, availability on the market, and reliability through time. The products shown here are all guaranteed by their respective manufacturers. The user is responsibility for choosing the brand and specific product. For correct use of the product and a satisfactory result of the work it is essential to read the latest technical datasheets for each of the products mentioned herein.

NOTE: Certain Lapitec® finishes (Urban, Arena, Fossil, Vesuvio and Dune) may have traces of engobe on the rear of the slab; before installing such slabs in high stress environments check for the possible presence of engobe residues and remove them by sanding the material lightly.

4. ADHESIVES AND GROUTS

LACTICRETE

ADHESIVES LINE

LATICRETE® 254 PLATINUM **C2TES1**

(Available on the Italian/European, Asian and American markets).
High bond strength, deformable one-component cementitious adhesive with extended open time and no vertical slip.

255 MULTI MAXTM **C2TES1**

(Available on the Italian/European, Asian and American markets).
High-performance, deformable, cementitious adhesive with no vertical slip and long open time. Suitable for fixing large size slabs

LATAPOXY® 310 **R2T**

(Available on the Italian/European, Asian and American markets).
Two-component epoxy adhesive suitable for spot fixing of material on vertical surfaces.

Technical datasheets: available at www.laticrete.com

GROUTS LINE

LATICRETE® SpectraLOCK® PRO Premium **RG**

(Available on the Italian/European, Asian and American markets).
Highly thixotropic grout for gaps from 1.5 ($^{1}/_{16}$") to 12 mm (½")

LATICRETE® PermaColorTM **CG2WA**

(Available on the Italian/European, Asian and American markets).
High-performance premixed cementitious grout for gaps from 1.5 ($^{1}/_{16}$") to 15 mm ($^{19}/_{32}$")

Technical datasheets: available at www.laticrete.com

4. ADHESIVES AND GROUTS

MAPEI

ADHESIVES LINE

ULTRAFLEX FT — **C2TES1**

(Available on the Italian/European, Asian and American markets).
High-performance deformable cementitious adhesive with no vertical slip and extended open time. Suitable for fixing large size slabs

GRANIRAPID — **C2FTES2**

(Available on the Italian/European, Asian and American markets).
Two-component, high-performance, highly-deformable, fast-setting and drying cementitious adhesive with no vertical slip and extended open time.

ULTRALITE MORTAR — **C2TES1**

(Available on the Italian/European and American markets).
One-component, high-performance, deformable, lightweight cementitious adhesive with no vertical slip and extended open time.

ULTRALITE S1 QUICK — **C2FTS1**

(Available on the Italian/European and American markets).
One-component, high-performance, deformable, lightweight, fast-setting cementitious adhesive with no vertical slip.

ULTRALITE S2 — **C2ES2**

(Available on the Italian/European and American markets).
One-component, high-performance, highly-deformable, lightweight cementitious adhesive with extended open time.

ULTRABOND ECO PU 2K — **R2T**

(Available on the Italian/European market).
High-performance two-component polyurethane adhesive with no vertical slip.

KERAPOXY ADHESIVE — **R2T**

(Available on the Italian/European market).
Two-component epoxy adhesive with no vertical slip.

Technical datasheets: available at www.mapei.com

4. ADHESIVES AND GROUTS

GROUTS LINE

ULTRACOLOR PLUS — CG2WA

(Available on the Italian/European, Asian and American markets).
High-performance, polymer-modified premixed cementitious grout, for gaps from 2 (3/32") to 20 mm (13/16").

KERACOLOR GG — CG2WA

(Available on the Italian/European, Asian and American markets).
High-performance, polymer-modified, premixed cementitious grout for gaps from 4 (5/32") to 15 mm (5/8").

KERAPOXY — RG

(Available on the Italian/European, Asian and American markets).
Two-component, anti-acid epoxy grout for gaps of at least 3 mm (1/8")

KERAPOXY CQ — RG

(Available on the Italian/European, Asian and American markets).
Two-component, anti-acid epoxy grout for gaps from 3 (1/8") to 10 mm (13/32")

KERAPOXY DESIGN — RG

(Available on the Italian/European, Asian and American markets).
Two-component, decorative, anti-acid, translucent epoxy grout for gaps from 3 (1/8") to 10 mm (13/32").

Technical datasheets: available at www.mapei.com

4. ADHESIVES AND GROUTS

PCI - BASF

ADHESIVES LINE

PCI FLEXMÖRTEL S1 **C2TES1**

(Available on the Italian/European market).
One-component high bond strength cementitious adhesive, deformable, with extended open time and no vertical slip.

PCI FLEXMÖRTEL S2 **C2TES2**

(Available on the Italian/European market).
Two-component, high-performance, highly-deformable cementitious adhesive with no vertical slip and extended open time.

Technical datasheets: available at www.pci-augsburg.eu/

GROUTS LINE

PCI NANOFUG® Premium **CG2WA**

(Available on the Italian/European market).
High-performance premixed cementitious grout for gaps from 1 ($^{1}/_{32}$") to 15 mm ($^{5}/_{8}$").

Technical datasheets: available at www.ardex.com

4. ADHESIVES AND GROUTS

SIKA

ADHESIVES LINE

SIKACERAM® 255 StarFlex LD — **C2TES1**

(Available on the Italian/European, Asian and American markets).
High-performance deformable cementitious adhesive with no vertical slip and extended open time.

SIKACERAM® 270 MultiFlow IT — **C2FTES1**

(Available on the Italian/European, Asian and American markets).
High-performance, lightweight, fast-setting cementitious adhesive with no vertical slip

Technical datasheets: available at www.sika.com

GROUTS LINE

SIKACERAM® CleanGrout — **CG2 WA**

(Available on the Italian/European, Asian and American markets).
Cementitious grout for gaps from 1 ($^{1}/_{32}$") to 8 mm ($^{5}/_{16}$").

SIKACERAM® LargeGrout — **CG2 WA**

(Available on the Italian/European, Asian and American markets).
Cementitious grout for gaps from 4 ($^{3}/_{16}$") to 20 mm ($^{13}/_{16}$").

SIKACERAM® EpoxyGrout — **RG**

(Available on the Italian/European, Asian and American markets).
Two-component epoxy grout for gaps from 2 ($^{3}/_{32}$") to 20 mm ($^{13}/_{16}$").

Technical datasheets: available at www.sika.com

4. ADHESIVES AND GROUTS

ARDEX

ADHESIVES LINE

ARDEX S 28 NEW MICROTEC C2FTES1

(Available on the Italian/European, Asian and American markets).
One-component, high-performance, flexible, fast-setting cementitious adhesive with no vertical slip and extended open time.

ARDEX S 28 NEW MICROTEC+ARDEX E90 C2FTES2

(Available on the Italian/European, Asian and American markets).
One-component, high-performance, highly deformable, fast-setting cementitious adhesive with added synthetic resins (E90), with no vertical slip and extended open time.

ARDEX X 78 MICROTEC C2ES1

(Available on the Italian/European, Asian and American markets).
High-performance, deformable, cementitious adhesive with extended open time.

ARDEX X 78 MICROTEC+ARDEX E90 C2ES2

(Available on the Italian/European, Asian and American markets).
One-component, high-performance, highly deformable, cementitious adhesive with added synthetic resins (E90), with extended open time.

ARDEX X 78 S MICROTEC C2FES1

(Available on the Italian/European, Asian and American markets).
One-component, high-performance, deformable, fast-setting cementitious adhesive with extended open time.

ARDEX X 77 MICROTEC C2FTES1

(Available on the Italian/European, Asian and American markets).
One-component, high-performance, deformable, fast-setting cementitious adhesive with no vertical slip and extended open time.

ARDEX X 77 S MICROTEC C2FTES1

(Available on the Italian/European, Asian and American markets).
One-component, high-performance, deformable, fast-setting cementitious adhesive with no vertical slip and extended open time.

ARDEX X 90 OUTDOOR MICROTEC3 C2FTES1

(Available on the Italian/European, Asian and American markets).
One-component, high-performance, deformable, fast-setting cementitious adhesive with no vertical slip and extended open time.

4. ADHESIVES AND GROUTS

GROUTS LINE

ARDEX G9S Flex 2-15 **CG2WA**

(Available on the Italian/European, Asian and American markets).
High-performance premixed cementitious grout for gaps from 2 to 15 mm (5/8")

ARDEX RG 12 1-6 **RG**

(Available on the Italian/European, Asian and American markets). Two-component, decorative, anti-acid, translucent epoxy grout for gaps from 1 (1/32") to 6 mm (¼").

Technical datasheets: available at www.ardex.com

5. SAFETY DEVICES

5.1/ WITHHOLDING HOOKS

For wall claddings using materials similar to Lapitec® in terms of weight and sizes, Italian standards (UNI 11493) prescribe the use of safety withholding hooks and pull-off resistance of the substrate of at least 1 N/mm^2. The hooks do not prevent damage related to improperly executed installation but they reduce the risk of accidents due to slab detachment while also providing an indication of pending detachment events. This manual contains a description of the operating system of the hooks, thanks also to the information provided by Raimondi S.p.A., the intellectual property rights holder and manufacturer of the system described below. Irrespective of the safety retention system chosen, it must have analogous characteristics to those of the system described. Although normative organisations are oriented towards making their use mandatory, withholding hooks are currently used solely at the discretion of designers. Lapitec S.p.A. strongly recommends that they be fitted for slab sizes greater than 600x600 mm (2x2"), for wall claddings installed at heights in excess of 2.5 m (98 7/16") above the ground and in situations in which the slabs are installed in areas of traffic or subject to the transit or presence of persons.




5.1.1/ Use of the hooks

Installation steps

- The upper edge of the slab rear face is cut to make one or more diagonal locations of approximately 8 mm (5/16in) in depth.
- The cuts can be made with a hand power tool or, on request, at our works.
- After removing any traces of oil and grease, fit the hooks in the locations and check to ensure they are inserted fully.
- Spread the adhesive on the wall, taking care to keep the areas where the hooks will be fitted free.
- Also the rear of the slab must be coated with adhesive (double buttering).
- Position the slab and drill the substrate in correspondence with the holes in the hooks (¼ - 5/16 in diameter drill bits).
- After removing any dust fix the hook with suitable fasteners (expansion fixings, screws, etc.).
- The slabs must be installed working from the bottom of the wall to the top.

Approximate consumption for a horizontal layout

	Maximum weight RAI FIX 8 mm (5/16in)	Hooks for slab
0 < x < 600 mm (2")	60 kg	1
600 mm (2") < x < 2,000 mm (6 9/16")	120 kg	2
2,000 mm (6 9/16") < x < 3,000 mm (9 7/8")	180 kg	3

NOTE: a vertical layout (vertical side>horizontal side) is permitted only with slabs having the long side <1500 mm (59in)

5. SAFETY DEVICES

RAI-FIX by Raimondi S.p.A.

Stainless steel withholding hook for slabs of at least 8 mm (5/16 in) in thickness

RAI-CUT by Raimondi S.p.A.

Routing unit to make diagonal cuts in the rear face of slabs. Compatible working thicknesses: ≥6 mm and ≤30 mm (¼ and 1 ¼")

Stainless steel structure with port for connection of suction hose (38 mm - ½" diameter) and semi-universal drive coupling for angle grinders. 850 W angle grinder (125 mm - 4 15/16" disc) supplied on request.

Technical datasheets available from: www.raimondispa.com

5. SAFETY DEVICES

5.1.2/ Matting and mesh

The mechanical strength or impact resistance of Lapitec® can be modified by the application of reinforcements materials bonded to the rear of the slabs.

The most commonly used materials are sheets of matting to impart greater mechanical strength and meshes to restrain the slab following impact fracture. Reinforced slabs can be supplied on request. If your application calls for the use of reinforced slabs contact the Lapitec S.p.A. technical department for an assessment of your requirements.

Caution: if materials are delivered with reinforcements applied to the rear of the slab always notify your adhesives supplier: not all adhesive products are fully compatible with reinforcement systems.

REALIZZAZIONE:
Pavimento esterno

LAPITEC®:
Arabescato Michelangelo e
Nero Antracite, Lithos

6. DESIGN

6.1/ INTRODUCTION

Design activities must specify the composition materials and sizing and also be carried out in compliance with all the necessary measures that can be taken to guarantee durability through time and safety of use.

The initial assessments when choosing the most suitable solution must concern the conditions in which Lapitec® will be installed in relation to use, position, accessibility and purpose:

- floor and/or wall
- indoor and/or outdoor
- private/public
- residential, commercial or industrial

Thereafter, the working conditions to which the Lapitec® will be subjected must be analysed:

- exposure to weathering
- exposure to pollutants or chemical substances
- thermal excursions
- traffic and intensity (pedestrian, vehicular, etc.)
- presence of water or other fluids on finished surface
- continuous immersion in water or other fluids
- routine maintenance cleaning requirements

The foregoing assessments will orientate the design choice in relation to the thicknesses, sizes, finishes and installation criteria of Lapitec®, to ensure the material is capable of meeting the performance requirements (e.g.: slip resistance, mechanical strength, etc.).

6. DESIGN

6.2/ CHOICE OF SIZES AND THICKNESSES

Lapitec® can be used in all the sizes that can be cut from the standard size; the choice of slab size must be made in accordance with the type of use.

In general, there are no restrictions in terms of maximum size that can be used, but when a large size is to be installed (side >600 mm) it is important to comply with a series of requirements in terms of safety of use and durability.

With regard to thicknesses, the following synoptic tables show the minimum values that can be used in different locations. If in doubt concerning the choice of a thickness, consult the Lapitec S.p.A. technical department.

LAPITEC FLOOR COVERINGS:

Substrate		Application				
		Indoor			Outdoor	
		Residential	Public/ commercial	Industrial	Pub/comm residential Pedestrian traffic	Pub/comm industrial Vehicular traffic
Cement screed	with heating	½"	½-¾"	not envisaged	not envisaged	not envisaged
	without heating	½"	½-¾"	¾-1¼"	½-¾"	¾-1¼"
Sulphate based screed (anhydrite)	with heating	½"	½-¾"	not envisaged	not envisaged	not envisaged
	without heating	½"	½-¾"	not envisaged	not envisaged	not envisaged
Concrete	cast in situ	½"	½-¾"	¾-1¼"	½-¾"	¾-1¼"
	prefabricated	½"	½-¾"	¾-1¼"	½-¾"	¾-1¼"
Acoustic insulation layers		½"	½-¾"	not envisaged	not envisaged	not envisaged
Preformed panels		½"	½-¾"	not envisaged	not envisaged	not envisaged
Waterproofing	membrane in sheets	½"	½-¾"	¾-1¼"	½-¾"	¾-1¼"
	liquid non-cement products	½"	½-¾"	¾-1¼"	½-¾"	¾-1¼"
	liquid cement products	½"	½-¾"	¾-1¼"	½-¾"	¾-1¼"
Existing substrates with organic adhesive residues (carpeting)		½"	½-¾"	¾-1¼"	not envisaged	not envisaged
Tiles/mosaic/existing stone surfaces		½"	½-¾"	¾-1¼"	½-¾"	¾-1¼"
Existing parquet		½"	½-¾"	not envisaged	not envisaged	not envisaged
Existing resilient flooring		½"	½-¾"	¾-1¼"	not envisaged	not envisaged
Existing resin flooring		½"	½-¾"	¾-1¼"	not envisaged	not envisaged
Existing metal flooring		½"	½-¾"	¾-1¼"	½-¾"	¾-1¼"

Important note for floors

The thicknesses shown above were determined on the assumption that substrates are constructed in compliance with the specific regulations, i.e. guaranteeing the required rigidity and mechanical strength (compressive strength and flexural strength). The reference standard for screeds is EN 13813.

By way of example, the compressive strength of a screed must be at least 15 N/mm^2 in residential spaces and at least 25 N/mm^2 in commercial spaces.

6. DESIGN

LAPITEC WALL COVERINGS:

Substrate		Application			
		Indoor			Outdoor
		Residential	Public/ commercial	Industrial	Res pub comm ind
Lime/cement render	with heating	½"	½"	½"	not envisaged
	without heating	½"	½"	½"	½"
Gypsum/anhydrite	with heating	not envisaged	not envisaged	not envisaged	not envisaged
	without heating	not envisaged	not envisaged	not envisaged	not envisaged
Concrete	cast in situ	½"	½"	½"	½"
	prefabricated	½"	½"	½"	½"
Tiles/mosaic/existing stone surfaces		½"	½"	½"	not envisaged
Waterproofing	membrane in sheets	on request	on request	on request	on request
	liquid non-cement products	on request	on request	on request	on request
	liquid cement products	on request	on request	on request	on request
Cement/fibre cement based panels		½"	½"	½"	½"
Wood panels		½"	½"	½"	not envisaged
Plasterboard sheets		½"	½"	½"	not envisaged
Existing metal surfaces		½"	½"	½"	on request
Thermal insulation/sound insulation panel		½"	½"	½"	not envisaged

Important note for walls

In the case of wall application in addition to complying with all the conditions for the laying of smaller sizes, the designer and installer must check the required parameters in terms of rigidity, mechanical strength and dimensional stability of the substrate and ensure that the adhesive used for installation is specifically recommended for the with large slab sizes.

For more information, refer to headings 3.2, 3.3.8, 3.3.9 and 5.1.1.

6. DESIGN

6.3/ SAFETY IN USE

6.3.1/ Choice of finish - slip resistance value

Lapitec® is produced with different surface finishes that assure different values of slip resistance. The choice must take account of the characteristics of the surfaces available, opting for the solutions that are best adapted to the specific environment.

6.3.2/ Health and hygiene - emission of noxious substances

Lapitec® does not release noxious substances of any kind so it is suitable for installation in all environments, including healthcare facilities and food processing premises.

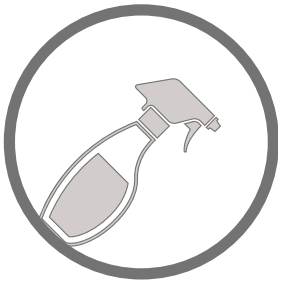
6.3.3/ Fire and sources of heat

Lapitec® is an A1 classified fire retardant material. When exposed to fire it does not ignite, release fumes or propagate flames. Violent thermal excursions such as those caused by direct exposure to flame may cause the material to break.

6. DESIGN

6.4/ DURABILITY

6.4.1/ Choice of finish - cleanability



The choice of a type of finish implies careful assessment also of its ease of cleaning during use. The various finishes of the material are associated with various levels of cleanability; in general, smoother surface finishes should be preferred for applications requiring more frequent cleaning and in situations in which cleaning machinery (e.g. pressure washers, industrial cleaning machines) cannot be used. Lapitec® can be exposed to most of the substances present in normal environments, however certain substances are particularly enduring and call for very deep cleaning cycles to remove them from the surface of the slabs.

The only solution for the most stubborn stains is mechanical removal by abrasion, which must be followed by the surface treatment regeneration procedure (Bio-Care). By way of example and limited to floor coverings, below we provide a diagram for the choice of finish in accordance with the degree of cleanability of the surface; this index is ascribed on the basis of the context and hence the ease of cleaning in the environment in which the Lapitec® covering is to be installed.

Finish	Indoor residential flooring	Indoor public flooring	Indoor industrial flooring	Outdoor residential flooring	Outdoor public flooring	Outdoor industrial flooring
Lux	A	A	A	A	A	A
Satin	A	A	A	A	A	A
Vesuvio	B	B	B	B	B	B
Fossil	NP	NP	NP	C	C	C
Arena	NP	NP	NP	C	C	C
Lithos	B	B	B	B	B	B
Dune	B	B	B	B	B	B
Urban	NP	NP	NP	C	C	C

A: Easy cleanability

B: Normal cleanability

C: Cleanability with the use of cleaning equipment

NP: Not applicable

6. DESIGN

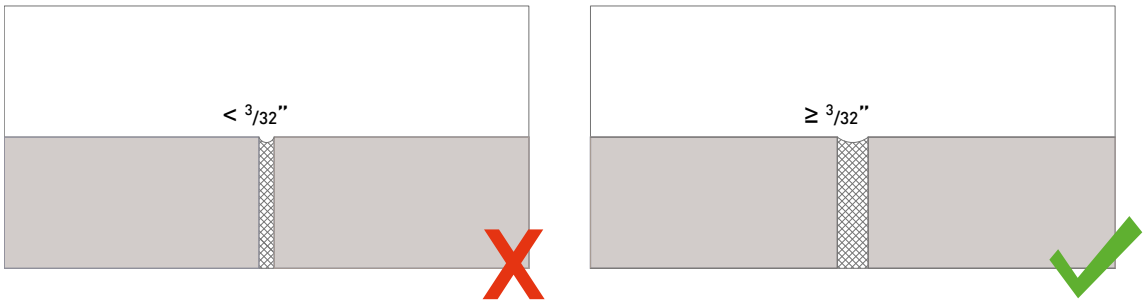
6.5/CRITERIAFORINSTALLATIONLAYOUT

Lapitec® can be designed with any composition layout (in-line gaps, staggered gaps, alternated gaps, etc.). Design to guarantee the durability and aesthetic appeal of the covering must take account of the layout of gaps and joints (structural and control joints). Irrespective of their type, substrates are subject to deformation and flexure resulting in stresses transmitted to the surface covering with possible consequent damage.

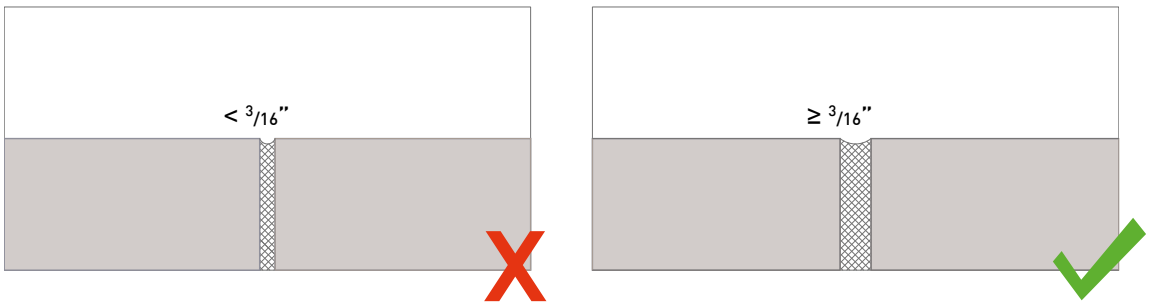
The slabs are sized and produced in compliance with the design tolerances, but aligning slabs side by side can draw attention to any minimum dimensional difference or defect in terms of flatness of the substrate. The designer must also bear in mind that the larger the slab size the more evident the types of imperfections described above.

6.6/ PROJECT DETAILS

6.6.1/ Gaps



Indoor gaps



Outdoor gaps

Lapitec S.p.A. prescribes a minimum gap width of 2 mm (3/32") at all tiles (irrespective of the type of substrate). Laying the material without gaps is not permitted. For surfaces exposed to major thermal excursions (e.g.: entrances connecting outdoor and indoor spaces, areas next to large windows, etc.) the minimum gap size is 3 mm (1/8"). The minimum permissible gap with for outdoor installation is 5 mm (3/16").

6. DESIGN

6.6.2/ Joints and gradients

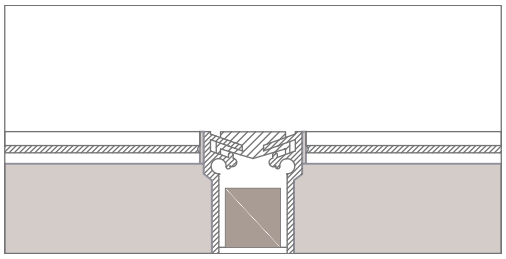


Fig.001: Structural joint

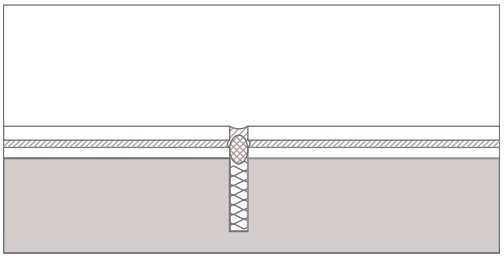


Fig.002: Control joint

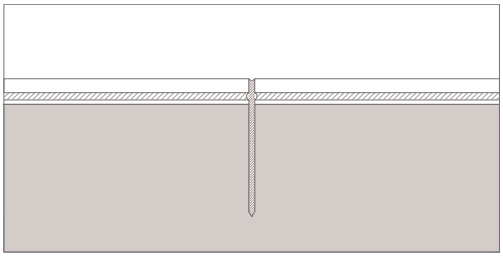


Fig.003: Expansion joint

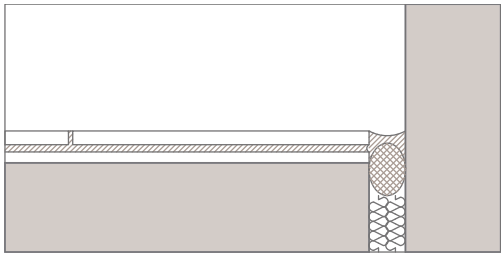


Fig.004: Perimeter joint

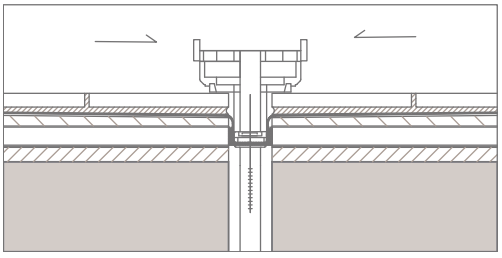


Fig.005: Drain

Structural joints in coverings must be made in correspondence with underlying structural discontinuities, also making use of prefabricated elements. The dimensions must comply with the dimensions of the equivalent structural joints in the substrate. (SEE FIG. 001)

Control joints (joints in the covering but not in the supporting structure) are made by subdividing the surface of the covering into square or rectangular areas. Each area must be no more than 25 m^2 (269sqft) for indoor environments and no more than 16 m^2 (172sqft) for outdoor environments. The width of control joints depends on the type of substrate and the stresses dimension is a function of the support and the application stresses ($^3/_{16}$-$^{13}/_{32}$" in general). The ratio between the length of the sides of the area shall be no more than 1:5. (SEE FIG. 002-003)

Perimeter joints are made leaving a minimum distance of 5 mm ($^3/_{16}$") from the edge of the covering (surround of columns, corners angles between floor and walls or walls and ceiling, stair risers, etc.). (SEE FIG. 004) Areas subject to the presence of liquids (water or liquid processing residues) must be provided with elements for drainage and discharge to prevent such liquids from collecting on the Lapitec® surface. To guarantee normal water run-off, the substrates of coverings must have an adequate gradient (1.0-1.5% indoor, 2% outdoor). For the creation of drains, Lapitec S.p.A. invites you to refer to the instructions provided by drainage outlet producers (SEE FIG. 005). If the adoption of external components (drainage outlets, grids, vents/jets, etc.) calls for machining operations on the surface of the slabs (holes, recessed areas, etc.) always consult Lapitec S.p.A. to check that the proposed operation is feasible.

6. DESIGN

6.6.3/ Edges, corners and skirting

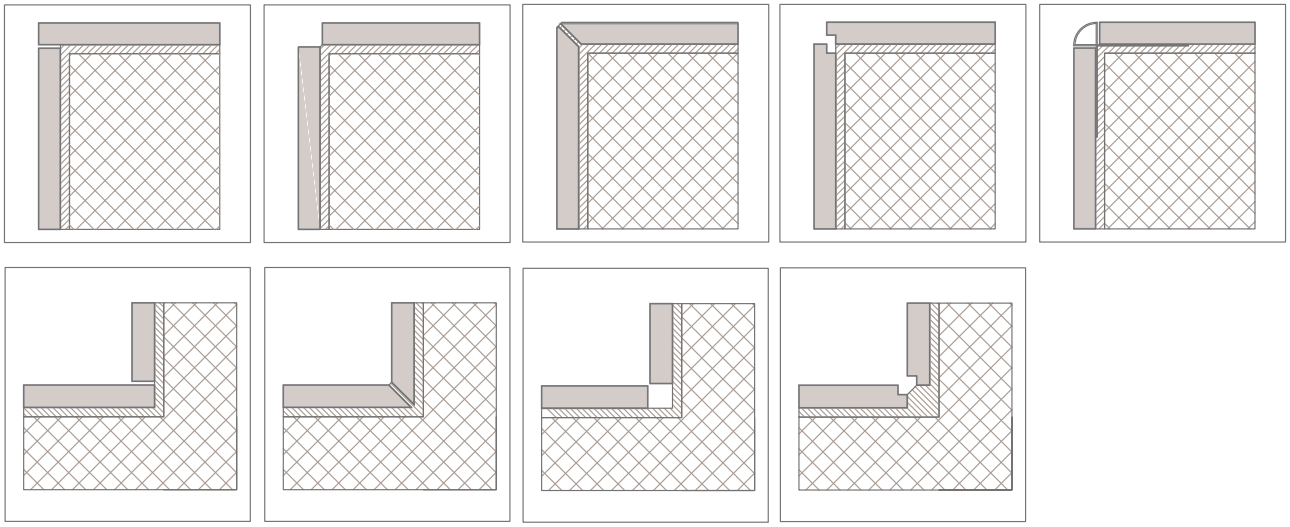


Fig.005: Edges and corners

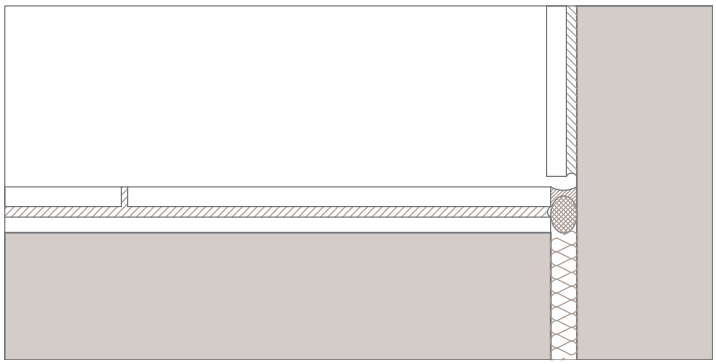


Fig.006: Skirting

Edges and corners can be made simply by aligning two slabs of Lapitec® or by performing machining operations to achieve high-prestige aesthetic results (mitres, half and full bullnose, etc.) (SEE FIG. 006). The choice must be made by the designer, always starting from the correct assessment of the stresses to which the Lapitec® slab will be exposed. The area wall and floor covering can be finished with a Lapitec® skirting (SEE FIG. 007). Skirtings can be made in our works and supplied on request. The design work must take account of a size of at least 5 cm (2") in height and a distance from the floor covering of at least 2 mm ($^{3}/_{32}$"). This gap must be filled with a suitable grout.

Private residential interior

CONSTRUCTION:
Interior floor and wall surfaces

7. INSTALLATION

7.1/ INTRODUCTION

An essential requirement to installing Lapitec® surface is the availability of a specialised workforce using suitable equipment.

Correct installation must proceed in compliance with each required step of the process; failure to perform adequate checks may impact negatively quality of the finished job. The following indications concerning all the checks to perform and measures to adopt when installing a Lapitec® surface

7.2/ INSTALLATION STEPS

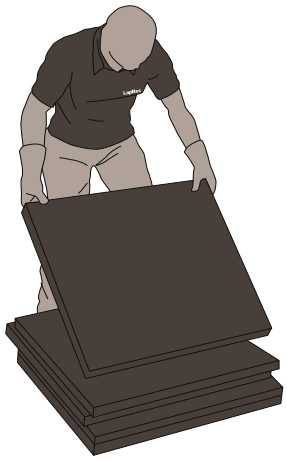
7.2.1/ Measurement and checks in the project and in the place of installation

Before installing the material check correspondence between the project and the installation space. The installer must check the layout of the slabs, identifying any differences with respect to the project and/or any interferences in creating the covering.

At the same time the installer must prepare a working plan with the sequence of the various installation steps. When installing large sizes pay special attention to handling of the slabs (make sure that there are no obstructions, or remove any obstructions that could interfere with handling).

7. INSTALLATION

7.2.2/ Storing and checking the material delivered to the job site

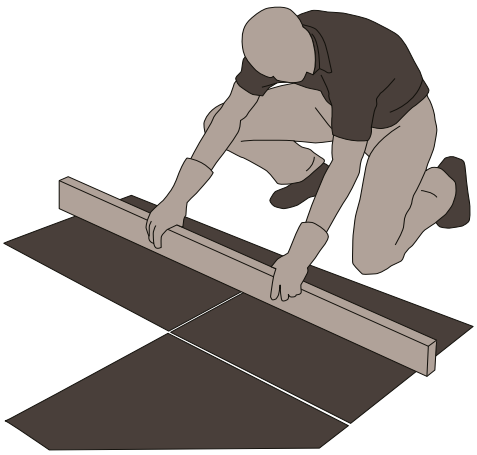


After establishing a working plan, the installed must identify a suitable place to receive the slabs on the job site, complying with all the prescriptions set down for unloading and storing Lapitec®.

Once the material has reached the job site, the slabs must be inspected carefully, making a note of any defect or nonconformity identified.

Important note: Defects that are not reported promptly and that cannot be ascribed with certainty to the delivery of defective material, will not be recognised for warranty purposes.

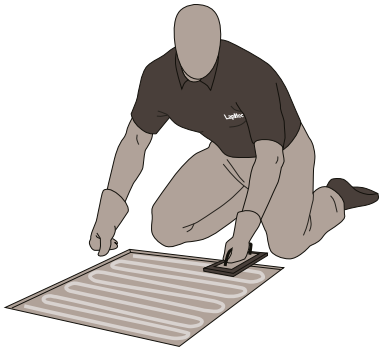
7.2.3/ Checking essential requirements for installation



Immediately before installing the covering the installer must make sure that all the requirements necessary to proceed are complied with. This is particularly true for the conditions of the substrate and requirements related to environmental conditions for the use of adhesives (temperatures and relative humidity values); in this matter it is important to consider not just the time of installation of the material but also the period thereafter required for the products employed to set/cure. For outdoor installation or installation in circumstances wherein the determination of stable conditions is difficult, use suitable protection systems (e.g.: rain protection tarpaulins, air conditioners, etc.). If the requirements for installation of the material are not complied with, do not proceed until all requirements have been established.

7. INSTALLATION

7.2.4/ Preparation and application of adhesives



Adhesives must always be prepared in accordance with the methods and dosages prescribed in the technical datasheets issued by their producers.
If in doubt concerning the correct use of an adhesive, always contact the producer directly.

Buttering criteria (full contact)
The adhesive buttering criterion depends on the purpose of the Lapitec® covering and the indications provided by the adhesive producer. Buttering procedures must always be such as to guarantee the required effective contact area.

The maximum thicknesses permitted for use of an adhesive product must be complied with. The use of more spacers than permitted for may have a negative impact on the bond strength of the adhesive.

When using large slab sizes and when installing slabs on a façade, full contact conditions must be guaranteed by using the double buttering technique.

The adhesive must be applied using notched trowels in compliance with the indications provided by the various producer companies.

The application times of an adhesive (pot life and open time) must be complied with.

7.2.5/ Application of Lapitec®

The covering must be laid taking care to guarantee the required contact surface area for the various different applications.

7. INSTALLATION

If using tile spacers, position them at the same time as positioning of the slabs and remove them before grouting the gaps.

For the installation of large and/or heavy slabs, the use of a limited number or spacers or levelling/ smoothing layers is permitted, on the condition that such measures do not reduce the area of contact prescribed for the different environments.

Once they have been laid, the Lapitec® slabs should be tapped lightly using a rubber mallet over the entire surface area to maximise adhesion to the substrate.

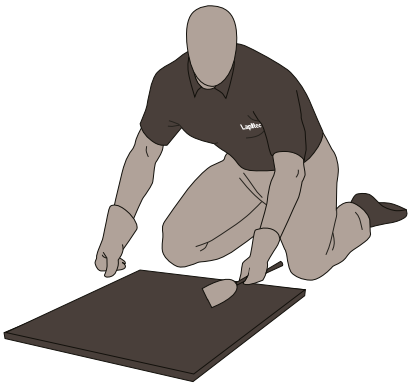
Evaporation of the process water and/or the solvents contained in the adhesives must not be impaired by placing tarpaulins or protections of any type over the covering: the vapours may react with the plastic or paper, compromising the proper outcome of the work.

If environmental conditions are unfavourable (too hot or too cold), consult the adhesive producer to find the most appropriate solution.

Take care to avoid impact damage to the slabs during the installation procedure.

Once a Lapitec® covering has been installed it must not be subjected to stress until the adhesive has set completely. The time before use of the finished surface as prescribed by the adhesives producer must be complied with at all times.

7.2.6/ Preparation and application of grouts



Grouts must always be prepared in accordance with the methods and dosages prescribed in the technical datasheets issued by their producers.

Grouts can be used only after the adhesives used for laying the slabs have set and once the times before grouting established by the producers have elapsed.

Use of a grout must take account of the width and depth of the gaps and the stresses to which the covering will be subjected.

To apply grouts use a rubber or plastic squeegee in order to ensure complete and compact filling while eliminating the risk of damaging the surface of the material.

Evaporation of the process water and/or solvents contained in grouts must not be impaired by placing tarpaulins or protections of any type over the covering: the vapours may react with the plastic or paper, compromising the proper outcome of the work.

7. INSTALLATION

If environmental conditions are unfavourable (too hot or too cold), consult the adhesive producer to find the most appropriate solution.

When using reaction resin grouts (RG class) take care to avoid fouling the surface of the Lapitec® as far as possible, using protective elements if necessary.

7.2.7/ Cleaning and application of Lapitec®

After installing the covering and applying the grout, proceed with cleaning and protection of the Lapitec® surface.

All residues of installation materials must be removed, taking care not to damage the covering. Use suitable detergent products to clean the surface.

Cleaning must be carried out in compliance with the setting times of the adhesives and grouts used and no later than the times specified for removal of the substances from the covering surface. If using reaction resin grouts, delayed cleaning of the surface may result in impairment of the aesthetic appearance of the Lapitec® surface. If deep cleaning is required, comply fully with the instructions given by Lapitec S.p.A. in chapter 9.

Cleaning must be carried out using manual and/or mechanical cleaning equipment.

Before proceeding, perform a cleaning test on a limited area of the covering.

After installing coverings, if further works must be carried out in the immediate vicinity of the new surface or above it (electrical connections, plumbing work, painting and decorating, etc.) always protect the surface of the covering with sheets and/or elements that prevent accidental impact and any kind of soiling.

In the case of outdoor surfaces, the sheets used must be resistant to the weather and must not be such as to deteriorate by becoming "stuck" to the surface of the covering.

7. INSTALLATION

7.3/ CONTACT SURFACES

Interior walls

The bonding surface must be equivalent to at least 75% of the total surface area of the slab to be installed.

In the case of large slabs (>3.87sqft) or slabs with one side longer than 600 mm (2 ft), the bonding surface must be equal to at least 85% and the remaining area must anyway be in contact.

Interior floors

The bonding surface must be equivalent to at least 85% of the total surface area of the slab to be installed.

In the case of large slabs (>3.87sqft) or slabs with one side longer than 600 mm (2 ft), the bonding surface must be equal to at least 95% and the remaining area must anyway be in contact.

Exterior walls

The bonding surface must be equivalent to at least 90% of the total surface area of the slab to be installed.

In the case of large slabs (>3.87sqft) or slabs with one side longer than 600 mm (2 ft), the bonding surface must be equal to 100% (full contact).

Exterior floors

The bonding surface must be equivalent to 100% of the total surface area of the slab to be installed (full contact).

CONSTRUCTION:
Internal flooring and cladding

LAPITEC®:
Bianco Crema, Vesuvio and Satin

8. SPECIAL APPLICATIONS

The characteristics of Lapitec® make it the ideal material for use in different surroundings. Constant immersion, salt spray atmosphere, presence of humidity and high temperatures are just some of the stringent conditions that Lapitec® can satisfy. Below we give several specific instructions concerning the environments in which the foregoing types of requirements are frequently present.

8.1/ SWIMMING POOLS

Lapitec® can be used in swimming pools in all the specified areas (border, waterline, submerged parts). The substrate must guarantee durability, taking account of the associated mechanical, chemical and thermal stresses. Water tightness of the pool must be checked before installing the covering. The adhesives and grouts used for the application must be suitable for the environment and used in compliance with the instructions given in the technical datasheets of the related producers.

The bonding surface must be equivalent to 100% of the total surface area of the slab to be installed (full contact).

8.2/ SPA CENTRES

Lapitec® is compatible with continuous exposure to water and steam and can thus be used in spa centres and similar environments.

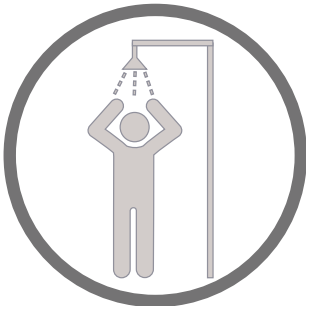
When installing the covering you must work over a properly waterproofed substrate (the covering is not designed to be fully watertight) in order to prevent the passage of moisture and consequent formation of mould and/ or stains in adjoining rooms.

The adhesives and grouts used for the application must be suitable for the environment and used in compliance with the instructions given in the technical datasheets of the related producers.

In the case of flooring be sure to use finishes that guarantee good anti-slip properties.

The bonding surface must be equivalent to 100% of the total surface area of the slab to be installed (full contact).

8.3/ SHOWER ROOMS



Lapitec® is compatible with continuous exposure to water and can thus be used in shower rooms.

When installing the covering you must work over a properly waterproofed substrate (the covering is not designed to be fully watertight) in order to prevent the passage of moisture and consequent formation of mould and/ or stains in adjoining rooms.

The adhesives and grouts used for the application must be suitable for the environment and used in compliance with the instructions given in the technical datasheets of the related producers. In the case of flooring be sure to use finishes that guarantee good anti-slip properties. The bonding surface must be equivalent to 100% of the total surface area of the slab to be installed (full contact).

8. SPECIAL APPLICATIONS

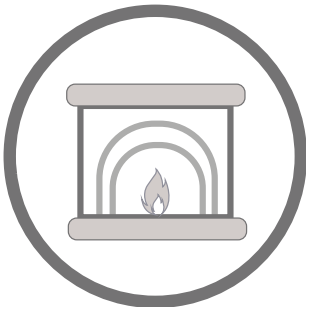
8.4/ TERRACES AND BALCONIES

The application of Lapitec® on terraces and balconies must proceed while guaranteeing suitable gradients to allow the run-off and drainage of rainwater.

Since the design of such structures always involves the application of a waterproof layer (liquid water barriers or membranes) drainage must be checked to prevent the accumulation of water under the covering resulting in detachment problems (due to freezing).

The bonding surface must be equivalent to 100% of the total surface area of the slab to be installed (full contact).

8.5/ FIREPLACES AND STOVES



Lapitec® can be installed near sources of heat such as fireplaces and stoves, taking care to avoid thermal shock caused by direct exposure to flames.

The substrate used to lay the slabs must be of same type as the slabs themselves in order to avoid non-uniform stresses caused by different rates of thermal expansion. Lapitec® slabs must always be installed without laying it over different types of materials.

The bonding surface must always be adequately isolated from the heat source (refractory bricks, layers of rock wool, heat reflective membrane, etc.).

Important note: if also the flue is to be clad, this too must be adequately insulated.

The designer and/or installer must ensure that the adhesive used is compatible with the maximum temperatures that can be reached by the substrate; if this is not the case, a mechanical fixing system must be employed.

8.6/APPLICATIONS ON THERMAL CLADDING

Application of the material by bonding it to an insulated substrate (thermal cladding) is permitted only if the covering is restricted to the base and in with the adoption of a specific substrate preparation and bonding cycle (e.g.: Mapetherm System - Mapei).

The material must be installed in compliance with all the indications given by the adhesives producer and be such as to prevent any problem of absorption that may arise through time due to mechanical stresses (frost) between the thermal cladding and the Lapitec® covering.

Application at heights (more than 2.5 m) is not permitted.

9. CLEANING AND MAINTENANCE

Routine cleaning

Daily care is the basis of correct maintenance of Lapitec® coverings. The material features excellent stain resistance, however prolonged or recurring use, especially in public places, may result in the deposit of particularly hard to remove grime. A good strategy to facilitate the removal of stains is to act before the substance in question has had time to dry.

For routine care, Lapitec® coverings can be cleaned with hot water with, if necessary, neutral detergents (e.g. soap, surface cleaners such as Fila Cleaner); the use of detergents of this type must always proceed in compliance with the indications of their producers, especially in relation to the dilution ratios.

After cleaning, rinse the surfaces thoroughly with hot water to remove all traces of detergent and then dry with a cloth.

The use of scourer sponges, waxes, fatty soaps, impregnating agents or other protective treatments is not necessary on Lapitec® surfaces; the products in question can leave an oil/shiny film on the surface that would impair the appearance of the Lapitec®.

Regenerative cleaning

In the case of particularly stubborn stains or if routine cleaning is not effective, a more targeted cleaning operation will be required. Stain removal must be carried out using specific products depending on the type of stain, taking care not to damage the surface of the slabs.

We repeat the recommendation that the time between the formation of a stain and its removal is decisive in relation to the effectiveness of the cleaning operation. Act promptly to increase the possibility of successful stain removal.

Lapitec S.p.A. has worked with surface cleaning specialist Fila Industria Chimica S.p.A. to find the most suitable and effective products for correct cleaning of Lapitec® coverings.

The manual contains a table showing possible types of stains on the covering and the products recommended by Fila Solution for their removal.

Before proceeding, Lapitec S.p.A. advises that users always consult the cleaning agents producer and obtain the latest documentation, the instructions of which must be followed at all times.

Cleaning products technical datasheets: available from www.filasolutions.com

The choice of detergent be made with reference to the products shown in the table or by finding an alternative product having identical characteristics to those of the recommended products.

After cleaning, rinse the surfaces thoroughly with hot water to remove all traces of detergent and then dry with a cloth.

9. CLEANING AND MAINTENANCE

Type of dirt	Detergent type
Oil and grease	FILA PS/87 or FILAFASEZERO
Beer	
Chewing gum	
Vinyl glue	
Tyre marks	
Silicone	FILA ZERO SIL
Ink	FILA PS/87 or FILA SR/95
Nicotine	
Urine and vomit	
Marker pen	
Hair dye	
Coffee	
Wine	
Blood	
Coca Cola	
Suction cup marks	A PS/87 or FILA CR10
Rust	FILA NO RUST
Metal/aluminium marks	FILA PHZERO
Cement-Potassium nitrate (after laying)	FILA DETERDEK
Limescale	
Pencil	
Engobe	
Epoxy grout (after laying)	FILA CR10
Enamel paint/wall paint	FILA NOPAINT STAR
Graffiti	
Dirty gap	FUGANET
Bitumen	FILASOLV
Candle wax	
Routine maintenance	FILACLEANER
Restoring wax finish	FILA SOLV or FILA ZERO SIL

Notes:
Stains such as ink, paint, wax, oil/grease can be removed with solvent such as thinners, nitrocellulose or white spirit. Before proceeding to clean the entire surface of the covering, test the effectiveness of the cleaner on a small area.
Cleaning operations are facilitated by the nature of the surface; to choose the most appropriate cleaning procedure refer to the table in heading 6.4.1 CHOICE OF FINISH - CLEANABILITY
Do not use concentrated hydrochloric acid, caustic soda or products that contain hydrofluoric acid and its derivatives.

Warnings:
If the surface is not cleaned after installation or if its inadequately cleaned, Lapitec S.p.A. declines all liability in relation to the effectiveness of subsequent cleaning and maintenance operations.

10. AFTER SALES

LapitecLAB - Research centre

Lapitec**LAB** is the Research and Development division dedicated to the study and experimentation of Lapitec® accessories and applications. The constant drive for innovation and the continuous development of new solutions allows us to meet the market's most specific needs.
Every single experience gained on international projects and designs for various applications is exploited to refine the products and accessories sold by Lapitec S.p.A. Through direct involvement with its customers, Lapitec**LAB** incessantly searches for new ways to make its service more complete and efficient for diverse needs.

LapitecACADEMY - Development centre

Lapitec**ACADEMY** is the division responsible for training and supporting professionals working with Lapitec® by means of shadow training in the factory and direct assistance. Thanks to the **Academy Community** service, all news and technical developments is rapidly disseminated throughout the entire network of personnel.
By attending the training course held by Lapitec**ACADEMY** each professional can obtain an **Approved Fabricator certificate** and gain useful tips and details concerning Lapitec® machining techniques.

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11. DISCLAIMER

The purpose of this manual is to provide general indications concerning the criteria for the use of Lapitec® as a floor or wall covering, indoors and outdoors, applied by means of cementitious adhesives and grouts.

The information contained herein are the result of experience accumulated by Lapitec S.p.A. and the state of the art of technical knowledge available at the time of publication.

Assessment of the fitness for use for a specific project and checking of compliance with statutory legislation in the country in which the project is to be carried out are the responsibility of a qualified professional person.

Lapitec S.p.A. declines all liability concerning the use of this document by the user.

Lapitec S.p.A. reserves the right to change and update the contents of this document without notice. Users must check to ensure they are in possession of the most up to date version, available and downloadable from www.lapitec.com.

12. CREDITS

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