Cementitious adhesives

Litoplus K55

HIGH-PERFORMANCE CEMENTITIOUS ADHESIVE WITH NO VERTICAL SLIP AND LONG OPEN TIME FOR THE INSTALLATION OF CERAMIC AND PORCELAIN TILES, PORCELAIN STONEWARE, MOSAICS AND NATURAL STONES ON INTERIOR AND EXTERIOR WALLS AND FLOORS. IDEAL FOR INSTALLATION IN SWIMMING POOLS, TANKS, FOUNTAINS, TURKISH BATHS AND SPAS. PRODUCT WITH VERY LOW VOLATILE ORGANIC COMPOUND EMISSION RATE.

ADVANTAGES / FEATURES

- Product with very low volatile organic compound (VOC) emission rate. Complies with class EC1^{PLUS} according to the EMICODE protocol and class A+ (Émission dans l'air intérieur - French Regulations)
- The super white color enhances the shades of vitreous mosaics
- Allows the installation of ceramic, porcelain and mosaic wall coverings without the need for plastic spacers
- Suitable for installation on heating screeds
- Suitable for overlaying on existing flooring
- Suitable for interior and exterior floor and wall applications, even in severe operating conditions
- Maintains excellent pot life over time, without any bothersome thickening
- The special additives give the product a very fluid texture and facilitate application using a notched trowel
- Product with excellent water-resistance

PACKAGING

20 kg (44lb) bags - 1,200 kg (2,645.5lb) standard pallet

INTENDED USE

Intended uses
Interiors - exteriors
Floors and walls
Underfloor heating
Facades
Overlaying
Terraces and balconies
Residential, public, commercial building
Ceilings
Tanks, swimming pools, fountains
SPAS and Turkish baths
Indoor wet areas (bathrooms, shower enclosures)
Industrial floors
Skim coat

Suitable materials
Ceramic and porcelain tiles
Single fired
Double fired
Terracotta - Clinker
Marble – Granite – Stone
Natural stones
Thin laminated stoneware slabs
Large sizes
Porcelain stoneware

Suitable substrates
Cement screeds
Self-levelers
Skim coats
Existing tiles
Waterproofing systems
Underfloor heating systems
Concrete
Gypsum
Fiber cement slabs
Gypsum and anhydrite
Aerated concrete
Plasters
Separation membrane

For example, it can also be used to install suitable materials in the following areas:

Interior floors in residential and public/commercial settings (pedestrian areas)	
Substrates	Longest allowable tile side (cm) (in)
Cement or Litocem/Litocem Pronto-based non-heating screeds	up to 120
Cement or Litocem/Litocem Pronto-based heating screeds	up to 90
Sulfate-based (anhydrite) non-heating screeds (1)	up to 120
Sulfate-based (anhydrite) heating screeds (1)	up to 90
Cast-in-place concrete (2)	up to 120
Pre-cast concrete	up to 30
Pre-existing tiled, mosaic, stone, agglomerate substrates (3)	up to 90
Pre-existing substrates with organic adhesive residue (4)	up to 90
Substrates waterproofed with Hidroflex, Aquamaster, Elastocem, Coverflex, Litoproof Plus	up to 90
Substrates with separation layer or membrane	up to 120
Interior floors in public/commercial and industrial settings with heavy traffic	
Substrates	Longest allowable tile side (cm) (in)
Cement or Litocem/Litocem Pronto-based non-heating screeds	up to 90
Cast-in-place concrete (2)	up to 120
Pre-cast concrete	up to 60
Pre-existing tiled, mosaic, stone, agglomerate substrates (3)	up to 90
Pre-existing substrates with organic adhesive residue (4)	up to 90
Substrates waterproofed with Litoproof Plus	up to 90
Substrates waterproofed with Hidroflex, Aquamaster, Elastocem, Coverflex, Litoproof Extreme	up to 90
Substrates with separation layer or membrane	up to 90
Interior walls in residential, public/commercial and industrial settings	
Substrates	Longest allowable tile side (cm) (in)
Lime/cement plaster	up to 90
Gypsum-based plaster (1)	up to 90
Cast-in-place concrete (2)	up to 90
Pre-cast concrete	up to 90
Pre-existing tiled, mosaic, stone substrates (3)	up to 90
Substrates waterproofed with Hidroflex, Aquamaster, Elastocem, Coverflex, Litoproof Plus	up to 60
Fiber cement and cement panels	up to 60
Waterproof and non-waterproof gypsum slabs (5)	up to 60
Elements in autoclaved aerated concrete (6)	up to 90
Thermal insulated and soundproof panels - Lightweight panels	up to 60
Exterior floors in residential, public/commercial and industrial settings	
Substrates	Longest allowable tile side (cm) (in)
Cement or Litocem/Litocem Pronto-based non-heating screeds	up to 90
Cast-in-place concrete (2)	up to 90
Pre-cast concrete	up to 30
Pre-existing tiled, mosaic, stone, agglomerate substrates (3)	up to 90
Substrates waterproofed with Aquamaster, Elastocem, Coverflex, Litoproof Extreme	up to 90
Substrates with separation layer or membrane	up to 90
Exterior walls	
Substrates	Longest allowable tile side (cm) (in)
Lime/cement plaster	up to 60
Cast-in-place concrete (2)	up to 60
Pre-cast concrete	up to 30
Substrates waterproofed with Aquamaster, Elastocem, Coverflex	up to 30
Fiber cement panels	up to 30

Key

(1) After treatment with Primer C or Primer X94. Maximum humidity = 0.5%.
(2) Curing time: minimum 6 months.
(3) After cleaning and degreasing with Litoscrub EVO.
(4) After treatment with the adhesion promoter Prepara Fondo EVO.
(5) After treatment with Primer C or Primer X94 for non-waterproof gypsum.
(6) After treatment with Primer X94.

INSTALLATION PLANNING

The only way to guarantee the long-lasting performance of ceramic and porcelain tile installations is to properly plan the process. It is therefore advisable to consult the national regulations in force in each country, for example standard UNI 11493 in Italy, which provides all necessary instructions regarding the choice of materials, correct planning, use and installation, so as to ensure all quality, performance and durability standards are safely met.
When installing large tiles or low thickness laminated porcelain stoneware slabs, we recommend paragraphs 7.13.8 and 7.13.9 of regulation UNI 11493 be carefully read. Moreover, certain producers of thin slabs provide installation manuals indicating the adhesive classes that need to be used depending on the size, characteristics and intended use of the slabs.
Some of the general precautions that need to be followed are listed below as an example.

Substrates

Before installation, check that substrates are clean, free of loose fragments, properly dried and cured, flat and level, and that mechanical strength requirements based on the intended use have been met.

Worksite conditions

Check the suitability of the temperature, humidity, light conditions etc. at the time of the product's application.

Materials

Check that all materials used for tiling (ceramic materials, leveling systems, adhesives, grouts, waterproofing products, etc.) are suitable for the intended use and have been correctly stored.

Expansion joints

Check that the perimeter, expansion, divider and structural elastic joints have been correctly designed and prepared. Divider joints are normally needed for 20/25 m^2 (21.9/27.3yd^2) indoor sections, and 9-15m^2 (9.84/16.4yd^2) outdoor sections. For exteriors, make sure joints are properly waterproofed and sealed.

Back-buttering

In the case of exterior installations, large tiles, floors with intense or heavy traffic, vibrating substrates, swimming pools and situations exposed to high temperature fluctuations, the adhesive mortar must be applied to both the substrate and the back of the tiles so as to obtain a solid bed of adhesive without any air bubbles.

Joints

In any type of ceramic and porcelain tiling, suitably sized joints must be created based on the following parameters:

- Type, format and size tolerance of tiles
- thermal expansion coefficients of tiling materials
- mechanical properties of installation materials
- position and trajectory of joints
- mechanical features of substrate
- Intended use and operating conditions

Butt joints are not allowed. Any plastic spacers must be removed before grouting.

PREPARATION OF SUBSTRATES

The substrates must be clean, solid, compact, crack-free, properly cured and without rising damp.
If it becomes necessary to create a slope, for example on balconies or footpaths, a leveling layer can be created using suitable leveling products such as Litoplan Smart.

- Excessively porous and absorbent or powdery substrates must be treated with the consolidating primer Primer C
- Smooth and compact substrates such as smoothed concrete, existing ceramic or agglomerate coverings, must be treated with the adhesion promoter primer Prepara Fondo EVO after being suitably degreased with specific detergents such as Litoscrub EVO
- In the case of anhydrite screeds, check for the presence of a suitable vapor barrier in order to prevent rising damp. Use a carbide method hygrometer to check that the residual humidity is less than 0.5%. The surface must be sanded and treated with Primer C
- Any cracks must be repaired with Multifondo EVO, sprinkling the fresh surface with sand or dried quartz with granulometry 0.4-1 mm (0.016-0.039in)

In any case, the respective technical data sheets must be consulted for correct use of the indicated products.

MIX RATIO

Gray 20 kg (44lb) (1 bag) – Water 6.4 l (1.69US gal lqd) (32%)
White 20 kg (44lb) (1 bag) – Water 7.0 l (1.85US gal lqd) (35%)

PREPARING THE MIX

Pour the right quantity of water, depending on the application, into a clean container and slowly add the powder, stirring with an electric drill with mixing paddle until a consistent mix is obtained without lumps.
Let the mix rest for about 5 minutes and then briefly mix again for a few seconds.
Do not use quantities of mixing water greater than those indicated to avoid product shrinkage during curing and the lowering of the final mechanical properties.
Do not add more water to the mix once setting has begun.

APPLICATION

Spread the mix onto the substrate using the smooth part of the trowel to create a layer approximately 1 mm thick (0.039in). Immediately afterwards, apply the product using the notched part of the trowel.
The trowel notch size will depend on the size of the tiles.
For mosaics, it is recommended to use a 3.5 mm (0.14in) notched trowel.
A back coverage of 65-70% is nonetheless required for interior installations, and 100% for exterior installations, floors subject to heavy traffic or mechanical stress, and swimming pools.
In exterior installations or areas subject to high stress, the adhesive should also be applied to the back of the slabs (back-buttering method).
The tiles must be laid on the adhesive when fresh, firmly pressed to ensure good contact.
The tiles must be installed with joint widths suitable for their size.
The product's pot life in normal temperature and humidity conditions is approximately 3 hours.
High temperatures will shorten it, low temperatures will lengthen it.
The product's open time in normal temperature and humidity conditions is approximately 30 minutes.
Very warm or windy climates, or particularly absorbent substrates may drastically reduce it to a few minutes. It is therefore recommended to regularly check that the adhesive has not skinned over.
In the case of mosaics mounted on adhesive paper or film, this must be removed at least 24 hours after installation once the adhesive has sufficiently set, to prevent the detachment of the tiles.
Take account of any expansion, perimeter, divider or structural joints.
Leave a space of at least 5 mm (0.20in) near walls or any surface elevations.

FOCUS

Marble, natural and recomposed stones
Materials subject to deformation or stains due to water absorption require a quick-setting (C2F) or reactive (R2) adhesive. Marble and natural stones, even if similar in nature, may have different characteristics. In case of doubt, contact the Litokol S.p.A. Technical Help Service for detailed information or to perform a laboratory test. Natural stone slabs with reinforced backing (resin, mesh, etc.) or specific treatments (for example anti-rising damp, etc.), unless otherwise prescribed by the manufacturer must be tested for compatibility with the adhesive. Before installation, check for any traces of dirt or material deposits on the back of the slabs. If so, these must be removed.

Facades
For exterior wall installations (H>3 m) (H>3.28yd) where tiled surfaces are subject to high levels of tension in expansion joints due to the variations in air temperature and relative humidity and considering the safety risks posed by any eventual detachments, it is recommended to consult the Litokol S.p.A Technical Help Service in order to precisely define the safest type of installation. In accordance with standard UNI 11493 – point 7.13.7), follow these general instructions: the substrate must guarantee a cohesive tensile strength ≥ 1.0 N/mm^2 (≥ 0.22lbf/in^2). For coverings with side > 30 cm (>12in) the designer must evaluate the potential need to use suitable mechanical fasteners for safety purposes. Always spread the adhesive directly onto the back of the material also.

Underfloor heating
After at least 4 days from installation of the screed developed with Litocem or Litocem Pronto, the heating system can be used with a variable supply water temperature between +20°C (68°F) and +25°C (77°F), kept constant for at least 3 days.
Then set the maximum design temperature and hold it for another 4 days. At the end of this cycle, bring the screed back to ambient temperature and install the covering (see standard EN 1264-4).

Swimming pools
The product can be applied directly on the concrete substrate or Elastocem, Coverflex, Aquamaster and Litoproof Extreme elastic waterproofing membranes.

- Respect the concrete curing time (minimum 6 months)
- For underground tanks, adopt preventive measures against possible capillary rising damp, which may cause the detachment of the waterproofing membrane applied inside the tank, for example on drains along the side walls of the excavations or waterproofing constituted by osmotic mortars such as Osmogrout
- Rectify the surfaces using suitable cementitious mortars such as Litoplan Smart
- Waterproof the internal surfaces of the tank with flexible waterproof membranes resistant to contact with chlorinated water such as Elastocem, Coverflex, Aquamaster and Litoproof Extreme
- It is advisable to perform a hydraulic seal test before installing the covering

GROUTING

Joints can be grouted after approximately 6-8 hours in the case of wall tiles and after 24 hours in the case of floor

tiles.
For grouting, it is possible to use the cementitious grouts Stylegrout 0-8, Stylegrout 3-20, Stylegrout Tech or the ready-to-use polymer mortar FillGood EVO, or, for grouting with special mechanical and chemical resistance, the two-component epoxy grouts Starlike® EVO or EpoxyÉlite EVO.

WARNINGS

- Spread the product at temperatures between +5°C (50 °F) and +35°C (86 °F) inclusive
- Respect the mix ratio
- Do not spread the product with thickness greater than 10 mm (0.39in)
- The product can be used to install separation membranes on various substrates, such as for example: cement screeds, heating screeds and concrete, following the installation instructions of the manufacturer
- The pot life is about 3 hours at a temperature of +23°C (73.4°F). Be sure to mix only the quantity of product that can actually be used within this period of time
- Do not use the product on floors that need to quickly set to light foot traffic
- To identify the adhesive most suitable to the requested type of application, it is recommended to consult the document “Synoptic table for choice of adhesives”
- In the case of exterior installations, protect the tiled surface against rain wash or direct sunlight for at least 24 hours, and against frost for about 5-7 days
- Do not use the product for applications not stated in this technical sheet
- If in doubt, contact the Litokol S.p.A Technical Help Service.

SAFETY INFORMATION

Consult the product safety data sheet, available on request.
PRODUCT FOR PROFESSIONAL USE

ITEM SPECIFICATION

#Ceramic and porcelain floor and wall coverings also in swimming pools will be installed using a high-performance cementitious adhesive with no vertical slip and extended open time in class C2TE according to EN 12004, such as Litoplus K55 by Litokol S.p.A.

IDENTIFICATION DATA

Appearance	Powder
Color	White or gray
Customs code	38245090
Shelf life	12 months in original packaging in a dry place.

APPLICATION DATA

Mix ratio	Water = 35% (7 liters (1.85US gal lqd) of water per 20 kg (44lb) bag) White
Mix ratio	Water = 32% (6.4 liters (1.69US gal lqd) of water per 20 kg (44lb) bag) Gray
Consistency of mix	Creamy thixotropic mortar
Mix curing time	5 minutes
pH of mix	13
Specific gravity of mix	1.50 kg/dm^3 (3.31lb/in^3)
Bonding time	60 minutes
Pot life	Approx. 3 hours
Applicable thicknesses	From 1 to 10 mm (From 0.039 to 0.39in)
Application	Notched trowel
Application temperatures	From +5°C to +35°C (+41°F to +104°F)
Waiting time for grouting	Wall: 4-6 hours – Floor: 24 hours
Set to light foot traffic	24 hours
Ready for use	7 days - Pools 7 days
Temperature of use	From -30°C to +80°C (-22°F to +176°F)
How to clean equipment	With water when product is fresh. Mechanically when product has set.
Consumption	3.5 mm (0.14in) trowel: 1.8 kg/m^2 (4lb/yd^2)
Consumption	6 mm (0.24in) trowel: 2.5 kg/m^2 (5.5lb/yd^2)
Consumption	8 mm (0.31in) trowel: 3 kg/m^2 (6.6lb/yd^2)
Consumption	10 mm (0.39in) trowel: 3.5 kg/m^2 (7.7lblb/yd^2)
Consumption	Back-buttering: 5 kg/m^2 (11lb/yd^2)

PERFORMANCE

Compliance	EN 12004 – ISO 13007	C2 TE
Initial tensile adhesion strength after 28 days	≥ 1.0 N/mm^2 (0.22lbf/in^2)	EN 1348
Tensile adhesion strength after immersion in water	≥ 1.0 N/mm^2 (0.22lbf/in^2)	EN 1348
Tensile adhesion strength after heat action	≥ 1.0 N/mm^2 (0.22lbf/in^2)	EN 1348
Tensile adhesion strength after freeze/thaw cycles	≥ 1.0 N/mm^2 (0.22lbf/in^2)	EN 1348
Open time	≥ 0.5 N/mm^2 (0.11lbf/in^2) after 30 minutes	EN 1346
Slip	≤ 0.5 mm (≤ 0.020in)	EN 1308
Resistance to humidity	Excellent	
Resistance to alkalis	Excellent	
Resistance to solvents	Excellent	
Resistance to acids	Low	

NOTES

Data detection at temperature +23 °C (+68°F), R.H. 50% and with no wind. May vary depending on the specific conditions of the installation site.

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