Powerflex K50

HIGH-PERFORMANCE, DEFORMABLE CEMENTITIOUS ADHESIVE WITH NO VERTICAL SLIP AND LONG OPEN TIME FOR THE INSTALLATION OF CERAMIC AND PORCELAIN TILES, PORCELAIN STONEWARE, MOSAICS AND NATURAL STONES, INCLUDING LARGE SLABS, ON INTERIOR AND EXTERIOR WALLS AND FLOORS. SUITABLE FOR OVERLAYING AND UNDERFLOOR HEATING. ZHERORISK TECHNOLOGY OFFERS VERY LOW RATE OF VOLATILE ORGANIC COMPOUND EMISSION.

ADVANTAGES / FEATURES

- Product exhibits very low volatile organic compound emissions rate (VOC)
- Single component deformable product (class S1 according to EN 12002)
- 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 and floor coverings
- Maintains excellent pot life over time, without any bothersome thickening
- Special additives give the product a very fluid texture and facilitate application using a notched trowel
- Suitable for interior and exterior applications.
- Complies with the most stringent Global Air Quality Regulations

PACKAGING

44lb (20 kg) bags - 2,645.5lb (1,200 kg) standard pallet of 60 bags

SUITABLE APPLICATIONS

Suitable application
Interiors and exteriors
Floors and walls
Underfloor heating
Facades
Overlaying
Terraces and balconies
Residential, public, commercial building
Tanks, swimming pools, fountains
Spas and saunas
Indoor wet areas (bathrooms, shower enclosures)

Materials
Ceramic and porcelain tiles
Thin laminated stoneware slabs
Recomposed stone made with resin or cement
Terracotta - Clinker
Marble – Granite – Stone
Natural stones
Single fired
Large-Format tiles and panels
Porcelain stoneware
Ceramic and vitreous mosaics
Double fired
Slabs 126x63 in (320x160 cm)

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
Insulating panels
Decoupling 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 (in) (cm)
Cement or Litocem/Litocem Pronto-based non-heating screeds	up to 60" (150 cm)
Cement or Litocem/Litocem Pronto-based heating screeds	up to 48" (120 cm)
Sulfate-based (anhydrite) non-heating screeds (1)	up to 60" (150 cm)
Sulfate-based (anhydrite) heating screeds (1)	up to 48" (120 cm)
Cast-in-place concrete (2)	up to 60" (150 cm)
Pre-cast concrete	up to 24" (60 cm)
Pre-existing tiled, mosaic, stone, agglomerate substrates (3)	up to 48" (120 cm)
Pre-existing substrates with organic adhesive residue (4)	up to 48" (120 cm)
Substrates waterproofed with Hidroflex, Aquamaster EVO, Elastocem, Coverflex, Litoproof Plus	up to 48" (120 cm)
Substrates with separation layer or membrane	up to 60" (150 cm)
Interior floors in public/commercial and industrial settings with heavy traffic	
Substrates	Longest allowable tile side (in) (cm)

Cement or Litocem/Litocem Pronto-based non-heating screeds	up to 60" (150 cm)
Cast-in-place concrete (2)	up to 48" (120 cm)
Pre-cast concrete	up to 36" (90 cm)
Pre-existing tiled, mosaic, stone, agglomerate substrates (3)	up to 48" (120 cm)
Pre-existing substrates with organic adhesive residue (4)	up to 48" (120 cm)
Substrates waterproofed with Litoproof Plus	up to 48" (120 cm)
Substrates waterproofed with Hidroflex, Aquamaster EVO, Elastocem, Coverflex, Litoproof Extreme	up to 48" (120 cm)
Substrates with separation layer or membrane	up to 48" (120 cm)
Interior walls in residential, public/commercial and industrial settings	
Substrates	Longest allowable tile side (in) (cm)
Lime/cement plaster	up to 60" (150 cm)
Gypsum-based plaster (1)	up to 60" (150 cm)
Cast-in-place concrete (2)	up to 60" (150 cm)
Pre-cast concrete	up to 60" (150 cm)
Pre-existing tiled, mosaic, stone substrates (3)	up to 48" (120 cm)
Substrates waterproofed with Hidroflex, Aquamaster EVO, Elastocem, Coverflex, Litoproof Plus	up to 60" (150 cm)
Fiber cement and cement panels	up to 48" (120 cm)
Waterproof and non-waterproof gypsum slabs (5)	up to 36" (90 cm)
Elements in autoclaved aerated concrete (6)	up to 36" (90 cm)
Thermal insulated and soundproof panels - Lightweight panels	up to 36" (90 cm)
Exterior floors in residential, public/commercial and industrial settings	
Substrates	Longest allowable tile side (in) (cm)
Cement or Litocem/Litocem Pronto-based non-heating screeds	up to 48" (120 cm)
Cast-in-place concrete (2)	up to 48" (120 cm)
Pre-cast concrete	up to 24" (60 cm)
Pre-existing tiled, mosaic, stone, agglomerate substrates (3)	up to 48" (120 cm)
Substrates waterproofed with Aquamaster EVO, Elastocem, Coverflex, Litoproof Extreme	up to 48" (120 cm)
Substrates with separation layer or membrane	up to 48" (120 cm)
Exterior walls	
Substrates	Longest allowable tile side (in) (cm)
Lime/cement plaster	up to 36" (90 cm)
Cast-in-place concrete (2)	up to 36" (90 cm)
Pre-cast concrete	up to 36" (90 cm)
Pre-existing tiled, mosaic, stone, agglomerate substrates (3)	up to 12" (30 cm)
Substrates waterproofed with Aquamaster EVO, Elastocem, Coverflex	up to 36" (90 cm)
Fiber cement panels	up to 24" (60 cm)

Key

(1) After treatment with Primer C or Primer X94. Maximum humidity = 0.5%.
(2) Curing time: minimum 28 days.
(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 relevant and current NTCA guidelines to ensure all quality, performance and durability standards are safely met.
When installing large tiles or low thickness laminated porcelain stoneware slabs, we recommend refer to manufacturer's installation guides and 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 all substrates should be structurally sound, stable, clean, and free of any substance or condition that may reduce or prevent proper adhesion, 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.

Suitable 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 22/27 yd^2 (20/25 m^2) indoor sections, and 10/16 yd^2 (9-15m^2) outdoor sections. For exteriors, make sure joints are properly waterproofed and sealed.

Back-buttering

For exterior installations, large tiles, floors with intense or heavy traffic, vibrating supports 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 dry.
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 1/50" - 1/24 in (0.4-1 mm)

Consult all respective technical data sheets must be consulted for correct use of the indicated products.

MIX RATIO

Gray 44lb (20 kg) (1 bag) – Water 6.1 qts. (5.8 l) (29%)
White 44lb (20 kg) (1 bag) – Water 6.1 qts. (5.8 l) (29%)

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.
The pot life is about 8 hours at a temperature of 73.4°F (+23°C).
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 1/16" (1 mm) thick. Immediately afterwards, apply the product using the notched part of the trowel.
The trowel notch size will depend on the size of the tiles.
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 product's pot life in normal temperature and humidity conditions is approximately 8 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.
The tiles must be installed with joint widths suitable for their size.
Take account of any expansion, perimeter, divider or structural joints.
Leave a space of at least 3/16" (5 mm) near walls or any surface elevations.
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.
Tiled surfaces are ready for use after about 7 days.

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>9.8 ft) (H>3 m) 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. For coverings with longest side > 12" (>30 cm) 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 68°F (+20°C) and 77°F (+25°C), 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).

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.

LIMITATIONS

- Spread the product at temperatures between 40°F and 95°F
- Respect the mix ratio
- Do not use the product on floors that need to quickly set to light foot traffic
- Do not spread the product with thickness greater than 9/16" (15 mm)
- The pot life is about 8 hours at a temperature of 73.4°F (+23°C)
- Do not add lime, cement or other foreign materials to the product
- Do not use the product for applications not stated in this technical sheet
- Do not use the product to install thin slabs with glass fiber mat backing
- In the case of exterior installations, protect the tiled surface against rain or direct sunlight for at least 24 hours, and against frost for about 5-7 days
- D not use the product on damp surfaces or surfaces subject to rising damp
- 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”
- 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

#Interior and exterior ceramic floor and wall coverings, including large tiles and moisture stable natural stones, will be installed using a high-performance cementitious adhesive with no vertical slip and extended open time in class C2TE according to EN 12004, with class S1 deformation ability according to EN 12002, such as Powerflex K50 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 = 29% (6.1 qts. (5.8 l) of water per 44lb (20 kg) bag) White
Mix ratio	Water = 29% (6.1 qts. (5.8 l) of water per 44lb (20 kg) bag) Gray

Consistency of mix	Creamy thixotropic mortar
Slake time	5 minutes
pH of mix	13
Density of mix	3.64lb/in^3 (1.65 kg/dm^3)
Open time	30 minutes
Pot life	Approx. 8 hours
Applicable thicknesses	From 1/32in to 9/16in (1 to 15 mm)
Application	Notched trowel
Acceptable application temperatures	From +41°F to +104°F (+5°C to +35°C)
Waiting time for grouting	Wall: 6-8 hours – Floor: 24 hours
Set to light foot traffic	24 hours
Ready for use	7 days
Serviceability Temperatures	From -22°F to +194°F (-30°C to +90°C)
How to clean equipment	With water when product is fresh. Mechanically when product has set.
Coverage	1/4" (6 mm) trowel: 80-90 ft^2 per 44 lb (20 kg) bag (2.5 kg/m^2)
Coverage	3/8" (10 mm) trowel: 70-75 ft^2 per 44 lb (20 kg) bag (4.0 kg/m^2)
Coverage	Back-buttering: 35-50 ft^2 per 44 lb (20 kg) bag (5.5 kg/m^2)

PERFORMANCE

Compliance	ISO 13007 - EN 12004	C2 TE S1
Initial tensile adhesion strength after 28 days	≥ 145 psi (1.0 N/mm^2)	EN 1348
Tensile adhesion strength after immersion in water	≥ 145 psi (1.0 N/mm^2)	EN 1348
Tensile adhesion strength after heat action	≥ 145 psi (1.0 N/mm^2)	EN 1348
Tensile adhesion strength after freeze/thaw cycles	≥ 145 psi (1.0 N/mm^2)	EN 1348
Open time	≥ 72 psi (0.5 N/mm^2) after 30 minutes	EN 1346
Slip	≤ 0.5 mm (≤ 0.020in)	EN 1308
Transverse deformation	≥ 2.5 mm (0.098in)	EN 12002
Resistance to alkalis	Good	
Resistance to solvents	Good	
Resistance to acids	Low	

NOTES

Data collected at temperature +73.4°F (+23 °C), R.H. 50% and with no wind. May vary depending on the specific conditions of the installation site.

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The information and provisions contained in this technical data sheet reflect our best experience. Given the impossibility of directly intervening on the conditions of the work site and execution of the works, they represent indications of a general nature, which are in no way binding on our Company. It is therefore advisable to perform a spot test to check the suitability of the product for the intended use. In any case, users must determine whether or not it is suitable for the intended use and shall assume all associated responsibility.

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