



Patented

LITOKROM STARLIKE DEFENDER

TWO COMPONENT ANTI-ACID, ANTIBACTERIAL AND ANTI-MOULD EPOXY MORTAR, TESTED AND CERTIFIED. SUITABLE FOR BONDING AND GROUTING CERAMIC TILES AND MOSAICS IN ENVIRONMENTS WITH HIGH HYGIENIC REQUIREMENTS WITH GAPS OF 1 TO 15 mm. IN WIDTH. PARTICULARLY SUITABLE IN COMBINATION WITH ANTIBACTERIAL CERAMIC TILES. 99.9% REDUCTION OF BACTERIAL LOADS.



UPGRADE

New patented formula UV - resistant attested by Modena and Reggio Emilia University .

DESCRIPTION

Two-component acid-resistant and antibacterial epoxy mortar. Part A consists of a mixture of epoxy resin, silica aggregate and additives. Part B consists of a mixture of organic catalysts. The main features of the product are:

- The ability to abate 99.9% of the main bacterial strains (Staphylococcus aureus and Escherichia coli).
- Extremely easy to apply and clean, even compared to leading cement sealants for grout joints.
- Stable and uniform colours on all types of tiles with exclusive chromatic effects.
- High mechanical strength.
- Waterproof.
- Total absence of cracks or crazing after hardening.
- Excellent chemical resistance.

EN 12004 CLASSIFICATION

Class RG – Reactive sealant for joints

EN 13888 CLASSIFICATION

Class R2T - Improved reaction resin adhesive with no vertical slip

FIELDS OF APPLICATION

Suitable for setting and grouting acid-resistant and antibacterial ceramic floor and wall tiles and mosaics with joints between 1 and 15 mm in environments requiring high performance in terms of hygiene and cleanliness such as:

- Health care facilities
- Analysis and research laboratories
- Child-care facilities and schools
- Sports facilities, locker rooms, gym showers
- Public and private swimming pools

- Collective and private kitchens
- Canteens
- Industries and agri-food warehouses
- Spas, saunas, steam baths

Also recommended for sealing ceramic tiling in residential dwellings in order to impart antibacterial properties and raise the level of living comfort, such as:

- Flooring and floor and wall coverings in general
- Underfloor-heated floors.
- Floor and wall coverings in bathrooms and showers.
- Kitchen counters
- Terraces and balconies.

Suitable for surfaces exposed to contact with harsh chemical substances (see chemical resistance chart) such as: cheese factories, butcher's, breweries, food industries in general. Also recommended to grout swimming pools or pools containing spring or brackish water.

- Product suitable for direct contact with food according to the Ministerial Decree of 03/21/1973 (Regulation regarding the hygiene of packaging, containers, utensils, which are designed to come into contact with foodstuffs or substances for personal use), and subsequent Decrees of the Ministry of Health 04.26.1993, n.220 and 07.22.1998, n.338 and 03.28.2003, n.123. A copy of the certificate may be requested from Litokol's technical department. The product can therefore be used to grout ceramic tiles in environments subject to direct contact with food, such as: surfaces used for processing meat, dairy products, flour, tanks designed for fish farming, kitchen counters in restaurants, fry shops, bakeries, etc..
- Suitable for bonding and grouting mosaics in swimming pools, on waterproof pool liners such as ELASTOCEM and Coverflex.

PRELIMINARY CHECKS AND JOINT PREPARATION

Make sure that the adhesive or the mortar used to bond the mosaic is completely hardened and dry. The joints must be clean, free of dust and empty for at least 2/3 of the thickness of the tiles. Any traces of adhesive or mortar escaping from the joints must be removed.

MIXING RATIOS

COMPONENT A 100 parts in weight COMPONENT B 8 parts in weight
The two components are pre-dosed in their respective packs.

PREPARING THE MIXTURE

Cut one corner of the sachet containing the catalyst (component B) located inside the bucket and pour it onto component A (paste). It is advisable to pour out the entire contents of the catalyst, rolling and squeezing the sachet progressively from the sealed side towards the cut side. Mix using a drill with a propeller at low speed until you achieve a smooth mixture without lumps. Scrape the sides and bottom of the bucket with a spatula or trowel to ensure no non-catalysed product remains. It is not advisable to mix by hand. The packs of the components are pre-dosed, and therefore make any error in mixing impossible. The resulting mixture remains workable for about 1 hour at a temperature of about +23°C

GROUTING THE TILED SURFACE

Apply the obtained mixture to the joints, using the special green rubber edged spreader (art. 104/G). For large surfaces you can use an electric single disc machine equipped with an anti-abrasion rubber disc. Remove any excess product using the same rubber spreader. The workability and hardening time of the product is greatly influenced by the ambient temperature. The optimum temperature for application is between +18 and +23°C. Under these conditions the product is a soft workable mortar, with a working time of approximately 1 hour. It will be possible to walk on it after 24 hours. At a temperature of +15°C, it will take three days before it can be walked on. Commissioning the tiled surface with the subsequent chemical attack is possible after 5 days at a temperature of +23 ° C and after 10 days at a temperature of +15 ° C. At temperatures between +8 and +12 ° C the product is very thick and difficult to apply. The hardening time is also greatly lengthened. It is advisable not to add water or solvents to improve the workability. At high temperatures, it is advisable to distribute the product as quickly as possible onto the surface, so as not to shorten the working time following the reaction heat present in the pack even further

CLEANING AND FINISHING

Cleaning and finishing the grouting should be done while the product is still fresh, and in all cases as quickly as possible, taking care not to empty the joints and without leaving any residue of the product on the surface of the tiles. This can be done either manually or by using a special electric single disc machine equipped with a felt pad.

MANUAL METHOD

Cover the grouted surface with clean water. Carry out initial cleaning using a float with damp white felt pad (art. 109/G), making circular movements both clockwise and anti-clockwise, in order to seal the sides of the tiles perfectly and to remove any excess sealant from the surface of the tiles.

Clean the surface a second time using a hard sweepex sponge (art. 131/G) to obtain a smooth, sealed surface, completely removing any residue of the product from the tiles, without emptying the joints and by drying any excess water. When the felt pad and sponge are soaked with resin and can no longer be cleaned, they must be replaced.

Stains or residues of transparent product can be removed after 24 hours or at any rate after grout hardening (the time of hardening depends greatly on the environmental temperature), using the specific cleaners LITONET (for floors) and LITONET GEL (for walls).

Read the relative technical data sheets for the correct use.

SINGLE DISC METHOD

After removing excess grout from the surface, sprinkle the grouted surface abundantly with clean water. Then begin cleaning the floor with a single disc machine equipped with a felt pad. Replace the disk when the felt pad is soaked with product.

Remove any halo-stains with LITONET detergents after 24 hours or at any rate after grout hardening (the time of hardening depends greatly on the environmental temperature).

USING LITONET - LITONET GEL TO REMOVE HALO-STAINS

Using the white felt pad (art. 109/G) spread the detergent over the entire surface you need to clean. Leave on for 15-30 minutes. Follow by brushing the surface using a white felt pad (art. 109/G) or a single disc machine for large areas. Rinse with clean water and dry immediately with a clean, dry cloth. Do not wait for the rinse water to evaporate as halo-stains will form on the ceramic surface.

USE AS ADHESIVE

Apply the mixture onto the substrate using a notched trowel with adequately sized notches and set the tiles by applying a good amount of pressure.

CAUTIONS

- Apply the product preferably at temperatures between +18 °C and +23 °C. Do not apply at low temperatures or high humidity so as to prevent the formation of surface carbonation which could affect the uniformity of the colour.
- Remove any excess product promptly from the surface of the tiles as, once it has hardened, the product can only be removed mechanically, with serious risks for the final result.
- Mix the two components (A+B) correctly.
- Change the water frequently.
- Change the felt pad and sponge when saturated with product.
- Do not walk on the newly grouted surface, in order to avoid damaging the flooring with resin residues.
- Do not cover the newly grouted surface with cloths or other material so as to prevent the formation of condensation that would lead to surface carbonation on the product, altering the uniformity of the colour. Wait at least 24-48 hours depending on the temperature before protecting the surface.
- The product cannot be used to grout terracotta or other porous materials and manufactured products such as concrete kerbs.
- When grouting natural stone, it is essential to carry out a preliminary test to verify whether the slabs absorb the epoxy resin. In this case it would form a darker-coloured halo-stain on the surface and sides of the slabs that can not be removed. This problem generally arises with light-coloured marbles.
- The product cannot be used for grouting tanks containing aggressive substances permitted for intermittent contact only (see chemical resistance chart).
- Do not mix the product with water or solvents.
- Do not use the product for applications that are not reported on this data sheet.

IDENTIFICATION DATA

Appearance	Component A: dense coloured paste
	Component B: thick liquid
Colours available	Bianco assoluto C.470
	Titanio C.310
	Silver C. 220
	Grigio C.280
	Antracite C. 240
	Travertino C.290
	Sabbia C.250
Customs classification	3506 91 00
Storage time	24 months in the original package in a dry place

APPLICATION DATA

Waiting time for grouting	Setting floor tiles with normal setting adhesive: 24 hours Setting floor tiles with rapid set adhesive: 4 hours Setting floor tiles with mortar: 7-10 days Setting wall tiles with normal setting adhesive: 6 – 8 hours Setting wall tiles with rapid set adhesive: 4 hours Setting wall tiles with mortar: 2-3 days
Mixing ratio	Component A 100 parts in weight Component B: 8 parts in weight The two components are pre-dosed in their respective packs.
Consistency of the mixture	Doughy
Specific weight of the mixture	1.55 kg/l
Useable time of the mixture	About 1 hour at T=+23°C
Allowed application temperatures:	From +12°C to +30°C
Recommended application temperatures:	From +18°C to +23°C
Can be walked on	24 hours at T=+23°C
Working time	5 days at T=+23°C
Width of the joints	From 1 to 15 mm
Used as a sealant	See attached table
Used as an adhesive	Notched trowel: 4 mm Consumption: 1.6 kg/m ²

CONSUMPTION AS GROUT kg/mq

Tile (mm)	Joint (mm)						
	1,5	2	3	4	5	7	10
10x10x4	1,40	1,86					
10x10x10	4,65	6,20					
15x15x4	0,8	1,7					
15x15x10	2,1	4,1					
15x30x8	1,2	2,5					
20x20x3	0,70	0,93	1,40	1,86	2,33	3,26	4,65
23x23x8	1,1	2,2	3,2	4,3	5,4	7,5	10,8
25x25x10	1,2	2,5	3,7	5	6,2	8,7	12,4
50x50x4	0,2	0,5	0,7	1	1,2	1,7	2,5
50x50x10	0,6	1,2	1,9	2,5	3,1	4,3	6,2
100x100x8	0,37	0,50	0,74	0,99	1,24	1,74	2,48
125x240x12	0,34	0,45	0,68	0,91	1,13	1,47	2,26
150x150x6	0,18	0,24	0,36	0,48	0,61	0,85	1,21
150x150x8	0,25	0,33	0,50	0,66	0,83	1,16	1,65
200x200x8	0,19	0,25	0,37	0,50	0,62	0,87	1,24
250x330x8	0,13	0,17	0,26	0,35	0,44	0,61	0,87
300x300x8	0,12	0,17	0,25	0,33	0,41	0,58	0,82
300x600x10	0,12	0,16	0,23	0,31	0,39	0,54	0,78
400x400x10	0,12	0,16	0,23	0,31	0,39	0,54	0,78
450x450x10	0,10	0,14	0,21	0,27	0,34	0,48	0,68
600x600x10	0,08	0,10	0,15	0,20	0,26	0,36	0,51

PERFORMANCE

Shear adhesion (EN 12003)	Initial $\geq 2 \text{ N/mm}^2$ After immersion in water $\geq 2 \text{ N/mm}^2$ After thermal shock $\geq 2 \text{ N/mm}^2$
Abrasion resistance (EN 12808-2)	$\leq 250 \text{ mm}^3$
Mechanical resistance to bending after 28 days in standard conditions (EN 12808-3)	$\geq 30 \text{ N/mm}^2$
Mechanical resistance to compression after 28 days in standard conditions (EN 12808-3)	$\geq 45 \text{ N/mm}^2$
Shrinkage (EN 12808-4)	$\leq 1,5 \text{ mm/m}$
Water absorption after 4 hours (EN 12808-5)	$\leq 0,1 \text{ g}$
Operating temperatures	From -20°C to $+100^\circ\text{C}$

PACKAGING

5 kg plastic bucket Standard pallet 450 kg

SAFETY INFORMATION according to 1907/2006/EC (REACH), Article 31

PART A

reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700) oxirane, mono[(C12-14-alkyloxy)methyl] derivs

Xi – Irritant

R 36/38 Irritating to eyes and skin.

R 43 May cause sensitisation by skin contact.

R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S 2 Keep out of the reach of children.

S 24/25 Avoid contact with skin and eyes.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 29/56 Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point.

S 37/39 Wear suitable gloves and eye/face protection.

S 46 If swallowed, seek medical advice immediately and show this container or label.

Contains epoxy constituents. See information supplied by the manufacturer.

PART B

Hazard-determining components of labelling:

3,6-diazaoctanethylenediamin

3,6,9-triazaundecamethylenediamine

Xi – Irritant

R 36/38 Irritating to eyes and skin.

R 43 May cause sensitisation by skin contact.

R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S 2 Keep out of the reach of children.

S 23 Do not breathe fumes/aerosol.

S 24/25 Avoid contact with skin and eyes.

S 29/56 Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point.

S 37 Wear suitable gloves.

S 46 If swallowed, seek medical advice immediately and show this container or label.

CHEMICAL RESISTANCE TABLE

(the table is a summary of the chemical resistance proof made according to regulation UNI EN 12808)

CHEMICAL RESISTANCE ON INDUSTRIAL FLOORS

Group	Name	Conc. %	CONTINUOUS USE				INTERMITTENT USE
			24 hours	7 days	14 days	28 days	
Acids	Acetic Acid	2,5	●	●	●	●	●
		5	●	●	●	●	●
	Hydrochloric Acid	37	●	●	●	●	●
	Citric Acid	10	●	●	●	●	●
	Lactic acid	2,5	●	●	●	●	●
		5	●	●	●	●	●
		10	●	●	●	●	●
	Nitric Acid	25	●	●	●	●	●
		50	●	●	●	●	●
	Oleic Acid	-	●	●	●	●	●
	Sulphuric acid	1,5	●	●	●	●	●
		50	●	●	●	●	●
		96	●	●	●	●	●
	Tannic Acid	10	●	●	●	●	●
Tartaric Acid	10	●	●	●	●	●	
Oxalic Acid	10	●	●	●	●	●	
Alkalis	Ammonia in solution	25	●	●	●	●	●
	Caustic Soda	50	●	●	●	●	●
	Sodium Hypochlorite Conc. Cl active	>10	●	●	●	●	●
	Caustic Potash	50	●	●	●	●	●
	Sodium Bisulphite	10	●	●	●	●	●
Concentrated solutions 20°C	Iposulphite Sodium		●	●	●	●	●
	Calcium Chloride		●	●	●	●	●
	Sodium Chloride		●	●	●	●	●
	Ferric Chloride		●	●	●	●	●
	Sugar		●	●	●	●	●
Oils and fuels	Petrol, Fuels		●	●	●	●	●
	Turpentine		●	●	●	●	●
	Gas Oil		●	●	●	●	●
	Olive Oil		●	●	●	●	●
	Lube Oil		●	●	●	●	●
Solvents	Acetone		●	●	●	●	●
	Ethylene Glycol		●	●	●	●	●
	Glycerine		●	●	●	●	●
	Ethyl Alcohol		●	●	●	●	●
	White spirit		●	●	●	●	●
	Peroxide Water	10	●	●	●	●	●
25		●	●	●	●	●	

KEY

- EXCELLENT RESISTANCE
- GOOD RESISTANCE
- POOR RESISTANCE

Although the information provided on this technical sheet represents the best of our knowledge and experience, it is intended purely as a guideline. The user must carry out preliminary practical tests for each specific job and is solely responsible for the final result.

Sheet no. 318

Revision no. 2

Date: August 2011

LITOKOL S.p.A.

Via G. Falcone, 13/1 42048 Rubiera (RE) Italy
Tel. +39 0522 622811 Fax +39 0522 620150
www.litokol.it email: info@litokol.it

COMPANY WITH QUALITY MANAGEMENT
SYSTEM CERTIFIED BY DNV
= ISO 9001:2008 =