

# DIATHONITE EVOLUTION

*Eco-friendly thermal, acoustic and dehumidifying plaster*

Premixed plaster, fiber-reinforced with cork (gran. 0-3 mm - 0-0.12 in), clay, diatomaceous earth and natural hydraulic lime NHL 3.5. Natural compound, highly breathable, ready to use, for thermal insulation and to restore rising damp, suitable both for inside and outside. It is the only product that sums up cold insulation features of cork and heat insulation features of stones. The product has good fire reaction and it is recyclable as inert. Its porosity and the presence of lime makes it extremely breathable, bacteriostatic and anti-mould.

## BENEFITS

- Insulation against cold and warmth (it guarantees good thermal lag dynamic parameters, up to 12 hours depending on the characteristic of the wall).
- Thanks to its high breathability it avoids mould and condensation.
- It absorbs and releases the excess humidity.
- Ideal for historic refurbishment.
- It preserves and protects masonry.
- It improves acoustic comfort (sound absorption).
- Eco-friendly
- Quick and easy construction system (thermal brick + thermal plaster).
- Very fast application system (by plastering pump).
- Made of natural hydraulic lime NHL 3.5 (EN 459-1).
- Excellent compression resistance.
- It can be applied to old plasters.
- Reaction to fire: class A2 - s1, d0.
- Seamless insulation.

## YIELD

kg/m<sup>2</sup> 3.70 (±10%) per cm of thickness.  
lb/ft<sup>2</sup> 1.92 (±10%) per inch of thickness.

## COLOUR

Light grey.

## APPLICATION FIELDS

Premixed plaster for inside and outside, suitable for thermal insulation, sound absorption and dehumidification. It solves thermal bridge and mould caused by humidity, ensuring a healthy living space and a good living comfort. Moreover *Diathonite® Evolution* is a completely natural compound, ideal wherever the use of eco-friendly materials is required.

## PACKAGING

18 Kg (39.68 lb) paper bag.  
Pallet: n° 60 paper bags.

## STORAGE

Store the product in its original containers tightly closed, away from sun, water, ice and kept at temperature higher than 5°C / 41°F). Storage time: 12 months.



Diasen srl

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EN 998-1

Specification for mortar for masonry - Part 1: Mortar for internal and external plaster

Thermal conductivity:  $\lambda=0.045$  W/mK (category T1)

Compression resistance: 2.7 N/mm<sup>2</sup> (391.6 lbf/in<sup>2</sup>) (category CS II)

Fire reaction: Euroclass A2-s1,d0

Vapour permeability value:  $\mu=4$

Capillary water absorption: 0.40 kg/m<sup>2</sup> min<sup>0.5</sup> (category W1)

Adhesion: 0,10 N/mm<sup>2</sup> (14.5 lbf/in<sup>2</sup>) – FP: B

Density: 360±20 kg/m<sup>3</sup> (22.5±1.25 lb/ft<sup>3</sup>)

Durability freeze-thaw cycle): analysis based on current regulation of the place where the mortar is used.



For application video, product page, safety data sheet and other information.

## Thermal – acoustic insulation - Plasters

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## Technical Data

Featured		Unit
Yield	3.7 (±10%) kg/m <sup>2</sup> per cm of thickness 1.92 (±10%) lb/ft <sup>2</sup> per inch of thickness	kg/m <sup>2</sup> lb/ft <sup>2</sup>
Aspect	powder	-
Colour	light grey	-
Specific weight	360 ± 20 22.5 ± 1.25	kg/m <sup>3</sup> lb/ft <sup>3</sup>
Granulometry	0 – 3 (0-0.12)	mm in
w/c ratio	0.50 – 0.65 l/kg 9-12 litre per paper bag (18 kg) 2.38-3.17 gal U.S per paper bag (39.68 lb)	l/kg Gal U.S./lb
Application temperature	+5 /+30 (+41/+86)	°C °F.
Working time (UNI EN 1015-9 – method B)	40	min
Drying time (T=20°C - 68°F ; R.H. 40%)	15	days
Storage	12 months in original container and in dry places	months
Packaging	18 kg paper bag 39.68 lb paper bag	kg lb

## LEED® Credits

LEED for New Construction & Major Renovation,  
LEED for Schools, LEED for Core & Shell, v. 2009

Thematic area	Credit	Point
Energy & Atmosphere	EAp2 - Minimum energy performance	compulsory
	EAc1 – Optimize Energy Performance	from 1 to 19
Materials & Resources	MRc2- Construction Waste Management	from 1 to 2
	MRc4 – Recycled Content	from 1 to 2
	MRc5 – Regional Materials	from 1 to 2
	MRc6 - Rapidly Renewable Materials	1
Indoor Environmental Quality	IEQp3 - Minimal Acoustical Performance*	compulsory
	IEQc3.2 - Construction Indoor Air Quality Management Plan—Before Occupancy	1
	IEQc4.2 - Low Emitting Materials - Paints and Coatings	1
	IEQc9 – Enhanced Acoustical Performance*	1
	IEQc11 - Mold Prevention*	1

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Final performances		Unit	Regulation	Result
Thermal conductivity( $\lambda$ )	0.045	W/mK	UNI EN 12667 ASTM C518	-
Thermal resistance (R) for 1 cm of thickness	0.222	m <sup>2</sup> K/W	UNI 10355 ASTM C518	-
Thermal resistance (R) for 1 inch of thickness	3.205	ft <sup>2</sup> °F h/BTU	- ASTM C518	-
Specific heat (c)	1000	J/kgK	UNI EN 1745	-
	0.239	kcal/kg °C	UNI EN 10456 -	
Thermal diffusivity (a)	0.114	m <sup>2</sup> /Ms	UNI TS 11300-1	-
Resistance to water steam diffusion	$\mu = 4$ WVT = 14	- grains/h·ft <sup>2</sup>	UNI EN ISO 12572 ASTM E96	highly breathable
Water absorption by capillarity	0.40	kg/m <sup>2</sup> min <sup>0.5</sup>	UNI EN 1015 - 18	category W1
Height of water penetration (after 90 minutes)	40	mm	UNI EN 1015 - 18	-
	1.57	in		
Sound absorption between 600 and 1500 [Hz]	$\alpha > 70\%$	-	ISO 354	-
Resistance to compression	2.7	N/mm <sup>2</sup>	UNI EN 1015-11 ASTM C349	category CS II
	391.6	lbf/in <sup>2</sup> (psi)		
	56390	psf		
Resistance to bending	1.5	N/mm <sup>2</sup>	UNI EN 1015-11 ASTM C348	-
	217.6	lbf/in <sup>2</sup> (psi)		
	31338	psf		
Dried mortar porosity	71.64% (17.83% macroporosity and 54.94% microporosity)	-	-	-
Adhesion onto the support (brick)	0.1-type B break (mortar break) 14.5	N/mm <sup>2</sup> lbf/in <sup>2</sup>	UNI EN 1015-12	-
Adhesion to tuff	0.201	N/mm <sup>2</sup>	UNI EN 1015-12	-
	29.15	lbf/in <sup>2</sup>		
Adhesion of marble to <i>Diathonite Evolution</i>	0.241	N/mm <sup>2</sup>	UNI EN 1015-12	-
	34.95	lbf/in <sup>2</sup>		
Adhesion of stone to <i>Diathonite Evolution</i>	0.243	N/mm <sup>2</sup>	UNI EN 1015-12	-
	35.24	lbf/in <sup>2</sup>		
Secant modulus	742 107618	N/mm <sup>2</sup> lbf/in <sup>2</sup>	UNI 6556	highly elastic
Fire reaction (Euroclass)	class A2 – s1, d0	-	UNI EN 13501-1	-

\* The above data, even if carried out according to regulated tests are indicative and they may be change when specific site conditions vary.

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Fire classification	class A	-	ASTM E84	Flame spread index 0 Smoke developed index 0
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## PREPARATION OF SUPPORT

Substrate must be completely hardened, dry and resistant. The surface must be thoroughly clean, well consolidated, without debris or detaching parts.

Before the application it is recommended to cover window sills, doorsteps, window and door fixtures and any element that will not be covered by the plaster.

### Brick

Primer is not needed, Diathonite Evolution can be applied directly to the substrate.

### Concrete

Damaged or crumbly concrete can be restored with *Buildfix CLS* (see technical data sheet).

Iron bars can be treated with *Anticorrosive 2K* (see technical data sheet).

Smooth: apply *Aquabond* primer (see technical data sheet).

Rough: primer is not needed, apply the plaster directly to the substrate.

### Cellular concrete

*Diathonite Evolution* can be applied over cellular concrete panels without primer.

### Masonry

If necessary, clean the surface with water jet cleaner or brush the surface.

Check the masonry, restore damaged or not fixed bricks and stones.

If there are salts, apply *Diathonite Regularization* (see technical data sheet).

To uniform the substrate use a lime based mortar to keep breathability.

### Old plaster

Make sure that the plaster is not hollow and well bonded to the substrate. If not it is recommended to partially or completely remove it.

With salts remove damaged plaster and apply *Diathonite Regularization* (see technical data sheet).

With painted plasters, given the big variety of paints present on the market, it is recommended to verify the adhesion or if *Aquabond* primer is needed (see technical data sheet).

Onto smooth plaster apply *Aquabond* primer (see technical data sheet) or, if needed, roughen the surface.

Onto rough plaster, primer is not needed and *Diathonite Evolution* can be applied directly to the substrate.

### Panels

Apply *Diathonite Evolution* directly over non treated cork panels. Given the big variety of panels present on the market, it is recommended to verify the adhesion or if *Aquabond* primer is needed (see technical data sheet).

Take care to put the panels close to each other.

### Wood

Apply *Diathonite Evolution* directly over non treated wood.

If wood is smooth or treated, prime the surface with *Aquabond* (see technical data sheet).

## MIXING

Based on the absorbency degree of the substrate and on the condition of the environment, it is recommended to measure out the right amount of water needed to have the correct adhesion. The amount of water indicated is merely indicative.

- If the product is mixed with a concrete mixer or with a mixing drill, add 9 – 12 lt / 2.38 - 3.17 gal U.S. of water per bag of *Diathonite Evolution* (18 kg – 39.68 lb). **Do not mix the material more than 3-4 minutes.**
- The mixture must be foamy.
- Do not add anything to the mixture. Use clean water.

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## APPLICATION

### Application by hand

1. It is **fundamental** to wet the surface particularly during summer season and if walls are exposed to sun. With high temperature it is fundamental to wet the plaster even after 2/3 from the application. If Aquabond primer is needed, it is not necessary to wet the substrate.
2. Apply a first coat of *Diathonite Evolution* by trowel of about 1.5 cm / 0.59 in of thickness.
3. Over the applied coat, prepare the area creating the reference bands to obtain the required thicknesses. Points and reference bands must be created with the same product or it is possible to use steel or wood edging. In this case, these must be removed as soon after the application of the last coat.
4. Corner sections can be placed together with reference bands, anyway before the application of the last coat.
5. To secure corner and angles, in multi floor application, use steel corner beads. These must be fixed with *Diathonite Evolution* to avoid thermal bridges.
6. Apply successive layers when the one below is superficially dry (after about 12/24 hours), up to the required thickness. Each layer must be at max 2.0 cm / 0.79 in.
7. Wet the plaster before the application of each layer.
8. Beyond 6.00 cm / 2.36 in of thickness it is advisable to use *Polites 140* plaster mesh (see technical data sheet). The net must be drowned into the plaster at about half of the total thickness. The mesh must be always used, also for lower thickness, when the plaster is applied onto panels, wood, plasterboard or to unstable substrates.
9. Where there are beams and pillars, the mesh must protrude on both sides of the concrete element of about 15 cm.
10. When smoothing the plaster, do not push *Diathonite Evolution* that much against the wall. This is required to preserve the porosity of the plaster. Use a straight edge to accurately smooth the surface.

### Application by pump

*Diathonite Evolution* can be applied using plastering machine for light weight pre-mixed products.

The set up of the machine varies accordingly to the specific type pump used.

It is possible to use plastering pump such as three phase PFT G4, equipped with stator D6-3, hollowed mixing blades (semi-closed), and conical material holder hose with a diameter of 35/25 mm, 14 to 16 mm nozzle.

It is **fundamental** to wet the surface particularly during summer season and if walls are exposed to sun, avoiding superficial pounding water. If Aquabond primer is needed, it is not necessary to wet the substrate.

1. Load the contents of the bags inside the hopper and adjust the flowmeter of the pump machine, starting with a high water flow and reducing it until reaching the most suitable mixture for the application.
2. Spray *Diathonite Evolution* bottom up.
3. Apply a first coat of *Diathonite Evolution* with a maximum thickness of 1 – 1.5 cm / 0.39 – 0.59 in. Successive layers must be no more than 2.0 – 2.5 cm / 0.79 – 0.98 in.
4. Any successive layers must be applied when the previous one is superficially dry and visually lighter in colour (after about 12/24 hours). Wet the plaster before the application of any layer.
5. Spray *Diathonite Evolution* with few interruptions. If this happens, place the nozzle into water to avoid any clot.
6. Over the applied coat, prepare the area creating the reference bands to obtain the required thicknesses. Points and reference bands must be created with the same product or it is possible to use steel or wood edging. In this case, these must be removed as soon after the application of the last coat.
7. Corner sections can be placed together with reference bands, anyway before the application of the last coat.

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## DRYING TIME

At 20°C / 68 °F and with relative humidity level of 40%, the product dries in 10-15 days.

- Drying time is influenced by humidity level and temperature and may significantly change.
- Protect *Diathonite Evolution* plaster from ice, direct sun light and wind.
- With high temperature, direct sunlight or strong wind it is necessary to wet the plaster 2/3 times per day for the first 2/3 after the application.
- At temperature higher than 28°C / 82°F, wet the plaster every 2 hours to avoid cracks.
- If applied internally, ventilate as much as possible the room during application and drying.

To finish the plaster it is possible to apply, both inside and outside, the following skim coats: *Argacem HP* (to have a rough texture 0-0.9 mm grain), *Argacem MP* (for a medium rough texture 0-0.5 mm grain) and *Argacem Ultrafine* for a smooth texture. For the application of these skim coats please see technical data sheet.

On top of skim coat, apply *Diathonite Cork Render*, *Plasterpaint Coloured*, *Argacem Coloured* or *Acrilid Protect Coating* outside, or any breathable and water repellent finish.

Internally it is possible to use *C.W.C. Stop Condense*, *Limepaint*, *Diathonite Cork Render* or breathable paint.

## SUGGESTIONS

- Do not apply at temperature (both of the substrate and the environment) lower than 5°C / 41°F and higher than +30°C / 86°F.
- During summer season, apply the product during the cooler hours of the day, away from sun.
- Do not apply with imminent threat of rainwater or ice, in condition of strong fog or with relative humidity level higher than 70%.
- If applied on the ceiling, *Diathonite Evolution* must be applied with plastering machine. We do not recommend hand application.
- If applied internally it is necessary that the outside surface does not absorb water. If so treat the outside surface with *BKK* or *BKK Eco*.
- In presence of exposed walls, apply a siloxane, transparent, breathable and water-repellent product such as *Diasen BKK* or *BKK Eco*.

## CLEANING

Wash tools with water before product hardens.

## SAFETY

For the handling, see product safety data sheet. While handling always use protective gloves and antidust mask.

Thermal – acoustic  
insulation - Plasters

