

# DIATHONITE ACOUSTIX

*Eco-friendly, sound absorbing, breathable cork-based plaster*

Premixed plaster for noise reduction (NR) and the realization of wall and ceiling sound-absorbing coatings. *Diathonite Acoustix* is environmentally friendly, formulated with natural raw materials such as cork (0-3 mm / 0-0.12 in grain size), clay, diatomaceous powders and hydraulic binder. Moreover, it is recyclable as an inert at the end-of-life cycle. Thanks to its excellent sound-absorbing ability, *Diathonite Acoustix* eliminates reverberation and reduces reflected echoes. The plaster has a high breathability, good thermal insulation, dehumidifying capacity and excellent reaction to fire. The porosity that characterizes the structure and the presence of natural hydraulic lime make the plaster also bacteriostatic and anti-mould.

## BENEFITS

- Excellent sound absorbing properties:
  - NRC **0.60**
  - $\alpha_w = 0.65$
- High breathability, thus avoiding mould formation and condensation.
- Excellent compression resistance
- Reaction to fire: class A1.
- Quick application (plastering machine).
- It can be applied on top of old plasters.
- Easily applicable on curved surfaces and complex geometries.
- Product obtained LEED credits.
- Product with double CE (EN 998-1, EN 998-2) and UKCA certification (BS EN 998-1, BS EN 998-2).

## YIELD

4.70 kg/m<sup>2</sup> (±10%) per cm of thickness.

2.45 lb/ft<sup>2</sup> (±10%) per inch of thickness.

## COLOUR

Light grey.

## PACKAGING

20 kg (44 lb) paper bag.

Pallet: n° 60 paper bags (1200 kg – 2646 lb).

## APPLICATION FIELDS

Premixed plaster for indoors and outdoors applications, it is suitable for the realization of sound-absorbing coatings on walls and ceilings of cinemas, auditoriums, conference rooms, places of worship, sports facilities and in general all the wide environments in which it is necessary to reduce noise. The product is also ideal for the noise reduction of facades and partition walls. *Diathonite Acoustix* is a natural compound and is suitable where environmentally friendly materials are required.

## STORAGE

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

## PREPARATION OF THE SUPPORT

The support must be completely hardened and solid. The surface must be thoroughly cleaned,



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dry, well-bonded, without crumbly and inconsistent parts, perfectly levelled, and free of dust and dirt.

## Brick

No need of primer, the application can be carried out directly on the support.

## Concrete

In case of distressed and crumbly concrete, restoration with suitable cement mortar should be planned. For the treatment of reinforcing steel bars apply suitable anti-corrosion products.

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

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

## Cellular Concrete

*Diathonite Acoustix* 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 is salt efflorescence, apply *Diathonite Regularization* (see technical data sheet). To uniform the substrate, use a lime-based mortar to keep breathability.

## Old plaster

Ensure that the plaster is consistent and well attached to the support, otherwise provide for partial or total removal. Whenever salts efflorescence is present, remove the damaged plaster and apply the *Diathonite Regularization* (see technical data sheet). With painted plasters, given the wide variety of paints on the market, it is recommended to make an adhesion test to verify the suitability for the application or the need to use the primer

*Aquabond*. On smooth plasters apply the *Aquabond* primer or, if necessary, perform a staking of the support. On rough plasters proceed with the direct application of *Diathonite Acoustix*.

## Panels

*Diathonite Acoustix* can be applied on untreated cork panels without using a primer. Due to the wide variety of panels available on the market, it is recommended to carry out an adhesion test to verify the suitability for the direct application of *Diathonite Acoustix* or the need to first use the *Aquabond* primer. To ensure best results, make sure that the panels are installed tightly.

## Wood

On non-treated wooden supports, proceed with the direct application of *Diathonite Acoustix* plaster. With smooth or treated wood, first proceed with priming the surface with *Aquabond*.

## MIXING

Depending on the degree of water absorption of the support, and also taking into account the environmental conditions, it is recommended to dose the right amount of water needed for achieving the correct adhesion. Therefore, the amount of water specified is indicative.

- If mixed with a **concrete mixer** or a **mixing drill**, add 12 - 14 L of clean water for each bag of *Diathonite Acoustix* (20 kg). **Do not mix more than 3-4 minutes.**
- Load the contents of the bags inside the hopper and adjust the flow meter of the machine: firstly, set it to **400-600 L/h** to moisten the tube, and then adjust the flow to **300-350 L/h** to proceed with the application.
- The blend must present a foamy consistency.
- Do not add external compounds to the mixture.

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## APPLICATION

### Application by hand

1. It is **essential** to wet the support, especially in summer and in case of walls directly exposed to the sun. In case the surfaces were primed beforehand, it is not necessary to wet the support.
2. With a masonry trowel apply a layer of *Diathonite Acoustix*, making sure to create a thickness of about 1,5 cm (0.59 inches).
3. Create reference points or bands to achieve the required thicknesses. Points or bands can be made with *Diathonite Acoustix* plaster or with aluminium or wood profiles. In the latter case, bands must be removed immediately after the application of the last layer.
4. Corner sections can be placed together with reference bands, in any case always before the application of the last coat.
5. To secure corners and edges provide for the use of aluminium corner guards. These aluminium guards must be fixed with *Diathonite Acoustix* to avoid thermal bridges.
6. Wet the plaster before applying each layer.
7. When the underlying coat is consistent to the touch and visually lighter (after about 12/24 hours) proceed with the application of one or more layers of *Diathonite Acoustix* until the specified thickness is reached. In any case make sure to maintain for each applied coat a thickness  $\leq 2,5$  cm (0.98 inches).
8. At 60 mm thickness or more, a mesh such as *Polites 140* (see technical data sheet) must be included in the middle of the total thickness. *Polites 140* must be used independently of the thickness for applications on panels, wood, plasterboard or on supports subject to movement.
9. While smoothing the plaster, do not compress *Diathonite Acoustix* to preserve the porosity of the product. Use

an H-shape or a knife to obtain a smooth surface, with fluid horizontal and vertical movements.

### Application by plastering machine

*Diathonite Acoustix* can be applied with plastering machines for lightened premixed products. The setting can change depending on the machine chosen. It is possible to use three-phase plastering machines (similar to PFT G4) equipped with a rotor stator D6-3, a semi-closed mixing shaft, and a conical spraying gun with a diameter of 35/25 mm, a nozzle of 14 or 16 mm.

1. It is **essential** to wet the support, especially in summer and in case of walls directly exposed to the sun. In case the surfaces were primed beforehand, it is not necessary to wet the support.
2. Load the contents of the bags inside the hopper and adjust the flow meter of the machine. Regulate water pressure through the flow meter, starting from a high dosage and decreasing the water flow until the consistency is suitable for the perfect grip of the material.
3. Spray the product downside up, thus applying a first coat of *Diathonite Acoustix* as a rough coat with maximum thickness of about 1,5 cm (0.59 inches).
4. Spray *Diathonite Acoustix* with few interruptions. If the interruptions require long waiting times, soak the nozzle in clean water to prevent the formation of a material cap in the gun.
5. Wet the plaster before applying each layer.
6. If the desired thickness can't be reached with the first coat, when the underlying layer is consistent to the touch and visually lighter (after about 12/24 hours) proceed with the application of one or more layers of *Diathonite Acoustix* until the specified thickness is reached. Following layer are to be applied with thickness never exceeding 2,5 cm (0.98 in).



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On top of the first layer, create reference points or bands to obtain the required thicknesses. Points or bands can be made with *Diathonite Acoustix* plaster or with aluminium or wood profiles. In the latter case, bands must be removed immediately after the application of the last layer.

7. Corner sections can be placed together with reference bands, in any case always before the application of the last coat.
  8. To secure corners and edges provide for the use of aluminium corner guards. These aluminium guards must be fixed with *Diathonite Acoustix* to avoid thermal bridges.
  9. At 60 mm thickness or more, a mesh such as *Polites 140* (see technical data sheet) must be included in the middle of the total thickness. *Polites 140* must be used independently of the thickness for applications on panels, wood, plasterboard or on supports subject to movement.
  10. Alongside beams and pillars, the mesh shall lean on both sides of the concrete element by at least 15 cm (5.9 inches).
  11. While smoothing the plaster, do not compress *Diathonite Acoustix* to preserve the porosity of the product. Use an H-shape or a knife to obtain a smooth surface, with fluid horizontal and vertical movements.
2. Load the contents of the bags inside the hopper and adjust the machine's flow meter.
  3. Create the reference bands for obtaining the desired thickness.
  4. Apply *Diathonite Acoustix* in layers with a maximum thickness of 2 cm (0.78 in).
  5. On still fresh product, drown the *Polites 140* mesh (see technical data sheet) at half the thickness, taking care to maintain an overlap of 3 cm on the joints. Avoid the formation of curls or bubbles. The use of the *Polites 140* is necessary on panels, plasterboard slabs, wooden slabs and in all cases where the support is subject to movement or is deteriorated. On mixed or concrete slabs, the use of *Polites 140* is not necessary below a thickness of 3,0 cm (1.18 in).
  6. Apply a second layer of *Diathonite Acoustix* when the underlying coat is hardened, making sure to perfectly drown the net into the plaster and avoid leaving holes on the surface. On particularly unstable supports it is advisable to fix the net with dowels or nails.
  7. *Polites 140* shall be cut off at the reference bands, taking care to maintain an overlap of 3 cm (1.18 in).
  8. The reference bands should be removed when the surface of the plaster is compact and not wet to the touch. The voids left by the bands should be filled with *Diathonite Acoustix*.

## Application to ceiling

For ceiling applications *Diathonite Acoustix* must be put in place with plastering machines for pre mixed. The setting can be changed according to the selected plastering machine. Hand application is not recommended. It is recommended to start with a semi-fluid plaster mixture and, if necessary, adjust the flow meter to the most suitable consistency for application.

1. If the surface has not be primed with *Aquabond*, proceed by thoroughly wetting the substrate.

While smoothing the plaster, do not compress *Diathonite Acoustix* to preserve the porosity of the product. Use an H-shape or a knife to obtain a smooth surface, with fluid horizontal and vertical movements

## DRYING TIME

At a temperature of 23 °C and relative humidity of 50% the product dries in 10-15 days.

- Drying times are affected by relative humidity and temperature of the



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environment, and can also vary significantly.

- If *Diathonite Acoustix*<sup>+</sup> is applied in high thicknesses, the drying time is considerably longer.
- Protect *Diathonite Acoustix*<sup>+</sup> from frost, direct insolation and wind while it is still curing.
- In case of high temperatures, hot sun or strong ventilation it is necessary to wet the plaster even 2/3 times a day for the first 2/3 days after application.
- At temperatures above 28 °C (+ 83 °F) wet the plaster every 2 hours to avoid cracks.
- If applied indoors, aerate as much as possible the environment during application and during drying of the product.

The application of mortars or coatings can decrease the sound-absorbing ability of the plaster depending on the thickness and the covering ability of the coating used.

## FINISHES

In **acoustic insulation interventions** it is possible to use both indoor and outdoor mortar, such as:

- *Argatherm*, with particle size 0-0,6 mm (0-0.023 in), if a thermal mortar with fine textures required.
- *Argacem Coloured*, with particle size 0-0,6 mm (0-0.023 in), to obtain smooth and coloured surfaces.
- *Argatherm Ultrafine*, with particle size 0 - 0,1 mm (0.004 in), to obtain perfectly smooth surfaces.

*Argatherm* and *Argatherm Ultrafine* mortars can be painted with Diasen finishes such as *Plasterpaint Coloured*, *Acrilid Protect Coating*, *Limepaint*, *Decork Design*, *Decork Alfareflex*, *Decork Façade*, *BKK Eco*, *Decorkrete* or other water-repellent and breathable finishes.

In **acoustic absorption interventions**, it is important that the surface maintains a rough

and porous appearance. *Diathonite Acoustix* can be painted directly applying the breathable lime-based paint called *Limepaint* (see technical data sheet).

If it is a finer appearance required, *Diathonite Acoustix* can be finished off with the following smoothing compound, which has both thermal and sound-absorbing properties:

- *Argatherm Acoustix*, with a fine grain size texture 0-0,6 mm (0-0.023 in), which contributes to thermal insulation ( $\lambda = 0,128$  W/mK) and guarantees an NRC of 0,50 (value referred to the application of 3 cm / 1.18 in of *Diathonite Acoustix* + *Argatherm Acoustix*).

## SUGGESTIONS

- Do not apply at environmental temperature or at support temperature lower than +5°C (34°F) and higher than +30°C (86°F).
- During summer season, apply the product in the cooler hours of the day, away from sunlight.
- Do not apply with imminent threat of rain or frost, in conditions of strong fog or with relative humidity higher than 70%.
- *Diathonite Acoustix* can be used with plastering machines for ceiling applications. Hand application is not recommended.
- If applied indoors, it is **essential** that the external surface does not absorb water. Otherwise, treat the surface with *BKK Eco*.
- In case of exposed walls, apply a water-repellent and breathable transparent siloxane product, such as *BKK Eco*.
- Before applying the product, it is recommended to cover door and windows thresholds, frame and any element that does not need to be coated.
- It is recommended to waterproof and protect all those points most subject to hygrometric stresses, such as at the base of the wall -near the ground- or in

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the grafts between the flat roof slab and the external walls.

- Whenever there are doubts about the consistency of the substrate, it is recommended to make an adhesion test area.
- The test area should allow to verify any chemical, mechanical and physical incompatibilities between *Diathonite Acoustix* and the support.

## CLEANING

The equipment used can be washed with water before hardening of the product.

## SAFETY

While handling, always use personal protective equipment (PPE) and respect the instructions described in product safety data sheet.

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

## Technical Data\*

Features		Unit
Yield	4.70 (±10%) for each cm of thickness	kg/m <sup>2</sup>
	2.45 (±10%) per inch of thickness	lb/ft <sup>2</sup>
Aspect	powder	-
Colour	light grey	-
Density	470 ± 30	kg/m <sup>3</sup>
	29.34 ± 1.87	lb/ft <sup>3</sup>
Grain size	0 – 3	mm
	0 – 0.12	in
Water to add to the mixture	0.60 – 0.75 L/kg 11 - 14 L for each 18 kg bag	L/kg
	0.072 - 0.090 U.S. gallon per paper bag (44.09 lb)	gal U.S / lb
Application temperature	+5 / +30	°C
	+41 / +95	°F
Workability time (UNI EN 1015-9 – method B)	40	min
Minimum thickness for application	1.5 / 0.6	cm / inches
Maximum thickness for each layer	3.0 / 1.18	cm / inches
Maximum thickness for each layer for ceiling applications	2.0 / 0.8	cm / inches
Maximum thickness for ceiling applications	3.0 / 1.18	cm / inches
Drying time (T=23°C; U.R. 50%)	10-15	days
Storage	12	months

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Packaging	20 kg (44 lb) paper bag	kg
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Final performances		Unit	Regulation	Results
Thermal conductivity ( $\lambda$ )	0.083	W/mK	UNI EN 1745	-
Thermal resistance (R) for 1 cm / 0.4 in thickness	0.120	m <sup>2</sup> K/W	UNI 10355	-
Vapour permeability coefficient ( $\mu$ )	4	-	UNI EN 1015-19	highly breathable
Compressive strength	5.3	N/mm <sup>2</sup>	EN 998-1	category CS III
	768.7	lbf/in <sup>2</sup> (psi)	EN 998-2	M 5
Flexural strength	1.9	N/mm <sup>2</sup>	UNI EN 1015-11	-
	273.6	lbf/in <sup>2</sup> (psi)		
Adhesion onto the support (brick)	0.10	MPa = N/mm <sup>2</sup>	UNI EN 1015-12	mortar break
Reaction to fire	class A1	-	UNI EN 13501-1	-
Chloride content	0.018 ± 0.003%	-	UNI EN 1015-17	-

Acoustic Performances		Unit	Regulation
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Noise Reduction Coefficient (NRC) <i>thickness 3 cm / 1.18 in</i>	0.60	-	ASTM C423
Sound Absorption Average (SAA) <i>thickness 3 cm / 1.18 in</i>	0.61	-	ASTM C423
$\alpha_w$ – single value of sound absorption <i>thickness 3 cm / 1.18 in</i>	0.65	-	UNI EN ISO 11654
Sound absorption class <i>thickness 3 cm / 1.18 in</i>	C	-	UNI EN ISO 11654
Acoustic absorption between 600 and 1500 [Hz] <i>thickness 3 cm / 1.18 in</i>	$\alpha > 70\%$	-	ISO 354
Increase in the <b>Sound Insulation Rating Index (R<sub>w</sub>)</b> compared to traditional plaster	3	dB	UNI EN ISO 10140-2 UNI EN ISO 717-1
Facade insulation (25 cm / 9.84 in brick + 3 cm / 1.18 in <i>Diathonite Acoustix</i> on the outside)	D <sub>2m,nT,w</sub> = 46	dB	UNI EN ISO 140-5 UNI EN ISO 717-1
Theoretic Transmission Loss (TL) (5 cm / 1.96 in external wall made of <i>Diathonite Acoustix</i> + 25 cm/ 9.84 in of <i>thermal brick</i> + 1,5 cm / 0.59 in of <i>plaster</i> )	R <sub>w</sub> = 59.0	dB	UNI EN ISO 140-5 UNI EN ISO 717-1
Theoretic Transmission Loss (TL) (2 cm / 0.78 in external wall made of <i>Diathonite Acoustix</i> + 20 cm / 7.87 in of <i>thermal brick</i> + 2 cm / 0.78 in of <i>Diathonite Acoustix</i> )	R <sub>w</sub> = 56.0	dB	UNI EN ISO 140-5 UNI EN ISO 717-1
Theoretic Transmission Loss (TL) (3 cm / 1.18 in external wall made of <i>Diathonite Acoustix</i> + 12 cm / 4.72 in of <i>brick</i> + 3 cm / 1.18 in of <i>Diathonite Acoustix</i> )	R <sub>w</sub> = 53.0	dB	UNI EN ISO 140-5 UNI EN ISO 717-1
Theoretic Transmission Loss (TL) (2 cm / 0.78 in external wall made of <i>Diathonite Acoustix</i> + 20 cm / 7.87 in of <i>brick</i> + 2 cm / 0.78 in of <i>Diathonite Acoustix</i> )	R <sub>w</sub> = 52.0	dB	UNI EN ISO 140-5 UNI EN ISO 717-1
Transmission Loss (TL) on site (2 cm / 0.78 in partition wall made of <i>Diathonite Acoustix</i> + 25 cm/ 9.84 in of “ <i>Poroton</i> ” <i>brick</i> + 2 cm / 0.78 in of <i>Diathonite Acoustix</i> )	R' <sub>w</sub> ≥ 51.0	dB	UNI EN ISO 140-4 UNI EN ISO 717-1

Frequency (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250
$\alpha_s$	0,19	0,16	0,08	0,33	0,28	0,43	0,51	0,63	0,75	0,76	0,74	0,75
$\alpha_p$	0,10			0,35			0,65			0,75		

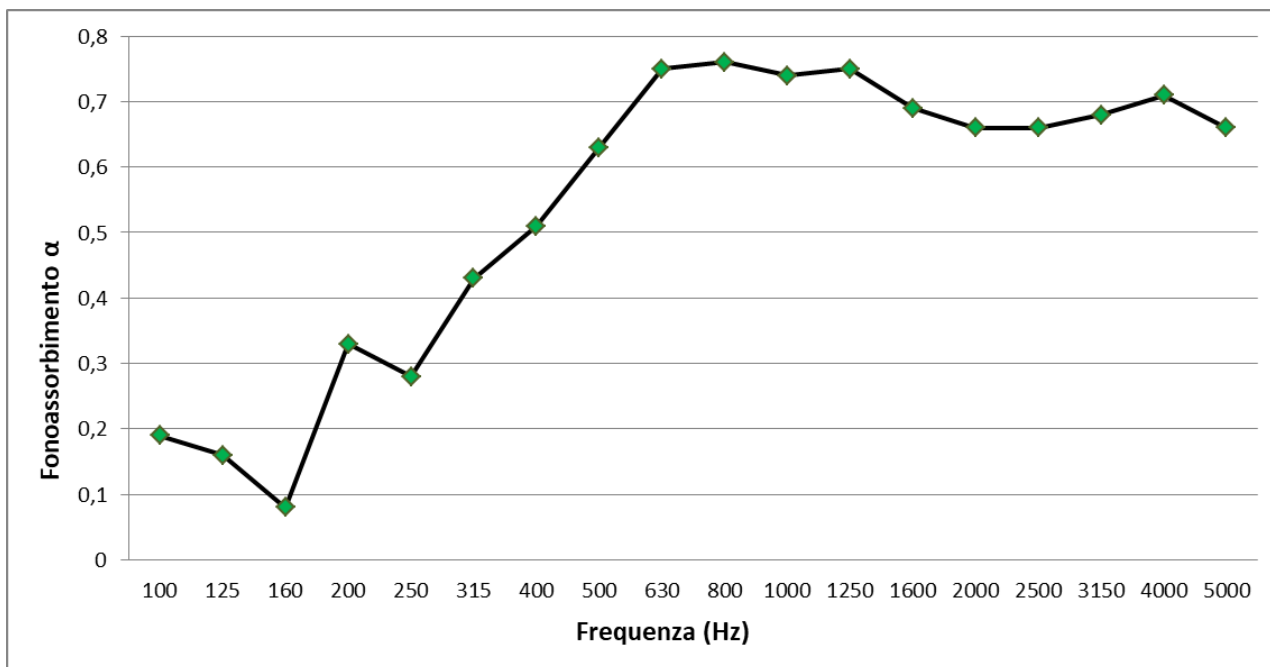
Frequency (Hz)	1600	2000	2500	3150	4000	5000
$\alpha_s$	0,69	0,66	0,66	0,68	0,71	0,66
$\alpha_p$	0,70			0,70		





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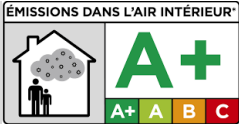


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## Indoor Air Quality (AIQ) Certification

### Evaluation of the results

Regulation or protocol	Version of regulation or protocol	Conclusion
French VOC Regulation	Decree of March 2011 (DEVL1101903D) and Arrêté of April 2011 (DEVL1104875A) modified in February 2012 (DEVL1133129A)	
French CMR components	Regulation of April and May 2009 (DEVP0908633A and DEVP0910046A)	Pass
Italian CAM Edilizia	Decree 11 October 2017 (GU n.259 del 6-11-2017)	Pass
AgBB/ABG	Anforderungen an bauliche Anlagen bezüglich des Gesundheitsschutzes, ABG May 2019, AgBB August 2018	Pass
Belgian Regulation	Royal decree of May 2014 (C-2014/24239)	Pass
Indoor Air Comfort®	Indoor Air Comfort 7.0 of May 2020	Pass
Blue Angel (DE-UZ 113)	DE-UZ 113 for “Low-Emission Floor Covering Adhesives and other Installation Materials” (Version January 2019)	Pass
BREEAM International	BREEAM International New Construction v2.0 (2016)	Exemplary Level
BREEAM® NOR	BREEAM-NOR New Construction v1.2 (2019)	Pass
LEED®	“Low-Emitting Material” according to the requirements of LEED v4.1	Pass
CDPH: Classroom scenario	CDPH/EHLB/Standard Method V1.2. (January 2017)	Pass

