DIATHONITE THERMOSTEP.047

Ultra-lightweight, resistant thermal and acoustic insulating screed

Fiber-reinforced bio-mortar with cork (granulometry 0-3 mm), clay, diatomaceous earths, and NHL 3.5 natural hydraulic lime. A natural product designed for the creation of ready-to-use lightweight thermal screeds, ideal for the insulation of slabs, floors, coverings, and ventilated roofs. *Diathonite Thermostep.047* can be used both indoors and outdoors, for renovations or new buildings, and allows for the thermal insulation of existing structures without weighing down the structure.

YIELD

3,90 kg/m^2 (±10%) per cm of thickness.
2,03 lb/ft^2 (±10%) per inch of thickness.

PACKAGING

18 kg (39.68 lb) paper bag.
Pallet: n° 60 paper bags (1080 kg – 2381 lb).

APPEARANCE AND COLOR

Powder	Light Grey

STORAGE

Store the product in its original, perfectly closed packaging, in well-ventilated areas, adequately protected from sun, water, frost, and kept at temperatures above +5°C (+41°F). Storage time: 12 months.

FIELDS OF APPLICATION

Ready-to-use, fiber-reinforced, lightweight screed. Suitable for the creation of lightweight thermal-acoustic screeds in new buildings and renovation projects. Particularly indicated for the correction of thermal bridges on the extrados of balconies. The product is characterized by excellent mechanical resistance.

BENEFITS

- Highly breathable.
- Insulates against cold and heat.
- Euroclass A1 reaction to fire.
- Resolves thermal bridges.
- Fiber-reinforced.
- Applicable even at low thicknesses.
- Suitable for embedding systems.
- *Diathonite Thermostep.047* can be directly tiled, after waterproofing with a suitable EN 14891 marked product.
- Improves the efficiency of underfloor heating.
- Does not weigh down the existing structure.

PREPARATION OF THE SUPPORT

The substrate must be completely hardened, properly cured, and possess adequate mechanical strength. The surface must be thoroughly cleaned, well-consolidated, and free of crumbly or inconsistent parts. In the presence of systems, provide a concrete capping to protect them.

Bricks/Blocks

Application can be carried out directly without the use of a primer. In the

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DIASEN

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presence of hollows or holes, provide for restoration with a suitable mortar.

Concrete

In the presence of damaged and crumbly concrete, proceed with restoration using a suitable cement-based repair mortar. Any exposed reinforcement bars must be previously treated with specific passivating and/or anti-corrosive products suitable for structural restoration.

- **Smooth Concrete**: Apply *Aquabond* primer (refer to the technical data sheet).
- **Rough Concrete**: Does not require a primer; the application can be carried out directly on the substrate.

Provide for the use of *Watstop* (see technical data sheet) on substrates against the ground.

Wood and Steel

These types of substrates are subject to significant expansion and movement; therefore, the use of a reinforcement mesh will be necessary.

- For thicknesses up to 50 mm, it is possible to use *Polites 140* fiberglass mesh or, alternatively, a galvanized welded metal mesh and *Aquabond* primer (see technical data sheet).
- For greater thicknesses, the use of a galvanized welded metal mesh in combination with *Aquabond* primer is always recommended (see technical data sheet).

Panels

For a workmanlike application, ensure that the panels are tightly joined together and that the mechanical fixing is able to support the weight of the plaster. Then, proceed directly with the casting of *Diathonite Thermostep.047*. In any case, provide reinforcement with fiberglass mesh, such as *Polites 140*, for thicknesses up to 50 mm or, alternatively, a galvanized welded mesh at mid-thickness for thicknesses exceeding 50 mm. For substrates not included in the technical data sheet, please contact the Diasen technical office.

APPLICATION BY PLASTERING MACHINE

Suggested plastering machines

The indicated plastering machines represent only some of the models available on the market. Other models with equivalent characteristics and performance can be used. All recommended models use screw or rotary systems, but the speed, mixer size, and screw geometry differ. Therefore, the consistency and flow of the plaster may require minor adjustments to the water/material ratio to achieve optimal results.

- *PFT G4*
- *PFT Ritmo XL*
- *Imer Koine 4*
- *Turbosol Giotto 4*
- *Putzmeister MP 25*

In the case of application with the aforementioned three-phase plastering machines, the ideal equipment includes the installation of a new **D6-3 stator/rotor (screw pump)** and a **closed shafts mixer**. The setup must be completed with a tapered hose (**Ø 35/25 mm**) and a **14 or 16 mm** nozzle to ensure the correct projection of the product.

- *PFT G5*

In the case of application with the aforementioned **plastering machine**, the ideal equipment includes the installation of a **D6 – 2L stator/rotor (screw pump)** and a **closed shafts mixer**. The setup must be completed with a **tapered hose** (length 150 mm, Ø 35/25 mm) and a **16 mm nozzle**

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to ensure the correct **projection** of the product.

- *Putzmeister SP 11 LMR*

For the *Putzmeister SP 11 LMR* diesel plastering machine, the setup must include a **2L6 screw pump (stator/rotor)**, a **250 mm** long hose with a **35 mm diameter**, and a **spray gun** with a **16 mm** nozzle.

Mixing

Load the content of the bags into the hopper. Adjust the machine's flow meter first to **400-600 L/h** to moisten the tube, then to **200-300 L/h** for regular application. The preparation must appear as a **lightweight** and **foamy mass**, characterized by a diffuse and homogeneous micro-alveolation, and **free of gloss**. The specified amount of water is indicative and may vary depending on the pressure and weather conditions. To avoid altering the chemical-physical balance of the compound, it is strictly forbidden to add any foreign product. Depending on the water absorption degree of the substrate and the environmental conditions, it is recommended to dose the correct amount of water necessary to achieve proper adhesion.

Application

1. It is essential to moisten the substrate, especially during the summer and on masonry exposed to the sun. If the surface has already been primed, proceed directly.
2. Create reference points or strips to achieve the required thicknesses. Points or strips can be made with *Diathonite Thermostep.047* or with aluminium or wooden profiles. In the latter two cases, the strips must be removed immediately after applying the last layer of plaster and filled with *Diathonite Thermostep.047*.
3. It is recommended to place the strips at a maximum centre-to-centre distance of 200 cm and to check the levelling of the slats with a spirit level.
4. Moisten the previous layer before applying the product.
5. Cast *Diathonite Thermostep.047* filling the area between the strips. The minimum achievable and usable thickness of the screed is 30 mm.
6. When the screed embeds the systems, it is necessary to reinforce it with *Polites 140* fiberglass mesh, up to a maximum thickness of 50 mm; for greater thicknesses, the use of a galvanized welded mesh is always recommended.
   6.1. The minimum screed thickness above the systems must be at least 30 mm;
   6.2. The mesh should be positioned immediately above the systems.
   6.3. Provide adequate concrete capping for the system pipes.
7. The thickness and reinforcement of *Diathonite Thermostep.047* must be determined in advance and according to the expected loads.
8. The maximum thickness achievable with a single layer is 50 mm.
9. If the design thickness is not reached with the first layer, apply further coats of *Diathonite Thermostep.047* only when the underlying layer is firm to the touch and visually lighter (approx. 12–24 hours), maintaining a thickness of ≤ 50 mm per coat.
10. Level the screed with an H-shaped straightedge resting on the strips, using a steady and continuous movement.
11. During the levelling phase, do not compress the plaster to preserve the product's porosity. As you proceed, it is advisable to use a plastic or other material float to smooth and compact the surface.

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APPLICATIONS BY HAND

Mixing

If mixed in a mixer or with a mixing drill, add **13 – 16.5 L** of clean water for each bag of *Diathonite Thermostep.047* (18 kg). The specified amount of water is indicative and may vary depending on the weather conditions. Do not mix the compound in the mixer for more than **3-4 minutes**. Depending on the water absorption degree of the substrate and the environmental conditions, it is recommended to dose the correct amount of water necessary to achieve proper adhesion.

Application

1. It is essential to moisten the substrate, especially during the summer and on masonry exposed to the sun. If the surface has already been primed, proceed directly.
2. Create reference points or strips to achieve the required thicknesses. Points or strips can be made with *Diathonite Thermostep.047* or with aluminium or wooden profiles. In the latter two cases, the strips must be removed immediately after applying the last layer of plaster and filled with *Diathonite Thermostep.047*.
3. It is recommended to place the strips at a maximum centre-to-centre distance of 200 cm and to check the levelling of the slats with a spirit level.
4. Moisten the previous layer before applying the product.
5. Cast *Diathonite Thermostep.047* filling the area between the strips. The minimum achievable and usable thickness of the screed is 30 mm.
6. When the screed embeds the systems, it is necessary to reinforce it with *Polites 140* fiberglass mesh, up to a maximum thickness of 50 mm; for greater thicknesses, the use of a galvanized welded mesh is always recommended.
   - 11.1. The minimum screed thickness above the systems must be at least 30 mm;
   - 11.2. The mesh should be positioned immediately above the systems.
   - 11.3. Provide adequate concrete capping for the system pipes.
7. The thickness and reinforcement of *Diathonite Thermostep.047* must be determined in advance and according to the expected loads.
8. The maximum thickness achievable with a single casting is 50 mm.
9. If the design thickness is not reached with the first layer, apply further coats of *Diathonite Thermostep.047* only when the underlying layer is firm to the touch and visually lighter (approx. 12–24 hours), maintaining a thickness of ≤ 50 mm per coat.
10. Level the screed with an H-shaped straightedge resting on the strips, using a steady and continuous movement.
11. During the levelling phase, do not compress the plaster to preserve the product's porosity. As you proceed, it is advisable to use a plastic or other material float to smooth and compact the surface.

FINISHING LAYERS

Diathonite Thermostep.060 is suitable for the installation of coatings such as tiles, stone, porcelain stoneware, and similar materials, following the same application methods described in the previous paragraphs. It can also be coated with *Diasen* decorative finishes, such as the cork-based paint, *Decork Mediterraneo*, or the *Decorkrete* micro-cement.

DRYING TIME

At a temperature of 23°C and relative humidity of 50%, the product dries completely in approximately 28 days if applied with a thickness of 50 mm.

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- Drying times are influenced by ambient temperature and relative humidity conditions and can vary significantly.
  - For greater thicknesses, consider approximately 7 - 10 additional days for each centimetre of thickness, depending on the environmental conditions.
- During the curing phase, protect the screed from frost, direct sunlight, and strong ventilation to prevent the formation of cracks. In the presence of high temperatures, direct sun, or intense wind, it is advisable to wet the surface 2–3 times a day for the first 2–3 days following application.
- Before laying the final flooring, the screed must have completed its hygrometric shrinkage and be adequately protected from loads and pedestrian traffic, in order to avoid damage and possible cracking phenomena.
- *Diathonite Thermostep.047* can be directly tiled with ceramic, terracotta, or porcelain stoneware coverings. It can also be coated with glued parquet after no less than 28 days of curing. If the screed is too rough for parquet installation, it is recommended to sand the surface with an abrasive disc machine and subsequently apply the product *Watstop*.
- The use of *Watstop* is advisable in all cases where it is necessary to consolidate the screed surface before laying the flooring.
- *Diathonite Thermostep.047* is not suitable for housing radiant panel heating systems. However, the product can be laid beneath the system to avoid potential heat loss.
- *Diathonite Thermostep.047* can be coated with Diasen liquid waterproofing products or coatings.

SUGGESTIONS

- Do not apply with ambient or substrate temperatures below +5°C or above +35°C.
- During the summer season, apply the product during the coolest hours of the day, sheltered from the sun.
- Do not apply with imminent danger of rain or frost, in conditions of heavy fog, or with relative humidity higher than 70%.
- When applied outdoors, it is essential to provide adequate expansion joints, created in a workmanlike manner and positioned at suitable intervals, in order to prevent the formation of cracks or fissures in the coating. The type, number, and positioning of the joints must be defined and coordinated by the site's Works Management, based on the specific design and execution conditions.
- Always maintain any pre-existing structural and/or expansion and/or insulation joints on the laying surface.
- Provide specific joints when a change of material occurs in the substrate, at fixed elements such as pillars, partition walls, doors or thresholds, and at variations in the laying direction.
- For the waterproofing of joints, use the specific sealant *Diaseal Strong* (see technical data sheet).
- In particular cases of high loads, provide for the use of a galvanized welded metal mesh, regardless of the applied thickness.

CLEANING

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

SAFETY

During handling, comply with the information reported on the product safety data sheet.

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DIATHONITE EVOLUTION

Intonaco ecologico termico e traspirante

ISO 9001® QUALITY ISO 14001® ENVIRONMENT ISO 45001® SAFETY

TECHNICAL DATA

* The reported data, although obtained by carrying out standardized test methodologies, are indicative and may undergo changes as the specific construction site conditions vary.

PHYSICAL / TECHNICAL DATA*		
CHARACTERISTIC DATA	**VALUE**	**UNIT OF MEASUREMENT**
Yield	3.90 kg/m² (±10%) *per cm of thickness*	kg/m²
	2.03 lb/ft² (±10%) *per inch of thickness*	lb/ft²
Aspect	powder	-
Colour	Light grey	-
Grain size	0 - 3	mm
	0 – 0.12	in
Density	360 kg/m³	kg/m³
	22.5 lb/ft³	lb/ft³
Water to add to the mixture	0,7 - 0,9 *13 – 16.5 L for each 18 kg bag*	L/kg
	0.084 – 0.108 *for each 18 kg bag (39.68 lb)*	gal U.S. / lb
Minimum thickness per coat	30/1.18	mm/in
Maximum thickness per coat	50/1.97	mm/in
Minimum thickness per coat *piping drowning*	30/1.18	mm/in
Application temperature	+5 /+30	°C
	+41 / +95	°F
Drying time *(T=23°C - 73.4°F; R.H. 50%)* *Thickness 5 cm – 1.97 in*	28	days
Storage	12	months
Packaging	18 kg (39.68 lb) paper bag	kg

PRESTAZIONI*				
PRESTAZIONI FINALI	**VALORE**	**UNITÀ DI MISURA**	**NORMATIVA**	**RISULTATO**
Thermal conductivity ($\lambda_{10,dry}$)	0,047	W/mK	UNI EN 1745	category T1
Specific heat capacity (c)	1000	J/kg K	UNI EN 1745 UNI EN 10456	-
	0,239	kcal/kg °C	-	
Attenuation of normalized impact sound pressure level ΔLw of a system composed by *Diafon + Diathonite Thermostep.047* (5.0 cm - 1.96 in)	$\Delta L_w = 22$	dB	UNI EN ISO 717-2	-
Footstep insulation index (5 cm Diathonite Thermostep.047 + Diafon + hollow–core concrete floor)	$L'_{nw} = 58$	dB	UNI EN ISO 140-7 DPCM 05.12.1997	-

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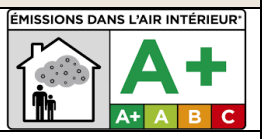
Resistance to compression	5,0	Mpa = N/mm^2	UNI EN 13813	C5
Resistance to water vapour diffusion (μ)	4	-	UNI EN ISO 12572	Highly breathable
Fire reaction (class)	class A1	-	UNI EN 13501-1	-

INDOOR AIR QUALITY (IAQ) 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

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