

DIATHONITE THERMOSTEP.047

Lightweight, durable, thermal screed

Fibre-reinforced bio-mortar with cork (grain size 0-3 mm), clay, diatomaceous earth powder and hydraulic binder. Natural product studied for the realization of ready lightened thermal screeds, ideal for the insulation of floors, ceilings and ventilated roofs. *Diathonite Thermostep.047* can be used indoor and outdoor, for renovations or new buildings, and it allows to thermally insulate floors and existing structures without weighing down the structure.

BENEFITS

- Lightweight product designed for application on new buildings or for renovation of floors, ceilings and roofs.
- Highly breathable, insulates against cold and heat.
- Euroclass A1 fire reaction.
- Fibre-reinforced. Extremely resistant.
- Ready to use.
- Can be used indoors and outdoors.
- Suitable for drowning installations.
- Product complies with CE marking (EN 13813).
- *Diathonite Thermostep.047* can be directly tiled, after waterproofing with a suitable waterproofing agent (products CE marked EN 14891).

YIELD

3.90 kg/m² per cm of thickness.
2.03 lb/ft² per inch of thickness.

COLOUR

Grey.

PACKAGING

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

APPLICATION FIELDS

Ready-to-use lightweight, fibre-reinforced screed for indoor and outdoor applications. It is suitable for creating lightweight thermal screeds

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for new buildings and on existing floors, floors and roofs. The product features improved mechanical strength.

STORAGE

Store the product in its original sealed packaging, in well ventilated areas, adequately protected from sun, water and frost and maintained at temperatures between +5°C / +41°F and +30°C / +86°F. Storage time: 12 months.

PREPARATION OF THE SUPPORT

The support must be completely hardened and solid (properly cured). The surface must be thoroughly cleaned, dry, well-bonded, without crumbly and inconsistent parts. In the presence of installations, concrete coverings should be provided to protect them.

Brick and concrete

The application can be carried out directly without the aid of a primer. In the presence of hollows or holes on the screed provide restoration with suitable mortar.



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Wood and Steel

Given that these kinds of supports are subject to considerable expansion and movement, it will be necessary to use galvanized metal reinforcement mesh and the primer *Aquabond* (see technical data sheet).

Panels

For a workmanlike manner, make sure that the panels are well placed together and perfectly anchored to the support. Then proceed directly with the jet of the *Diathonite Diathonite Thermostep.047*.

In this case it is necessary to use a galvanized metal mesh electro-welded. For media not present in the technical sheet contact Diasen technical office.

MIXING

Depending upon water absorption of the substrate and environmental conditions, it is recommended to determine the amount of water needed to obtain the correct adhesion. The amount of water indicated on the packaging is merely indicative.

Mix the product in a concrete mixer adding 12.5 L (class S1) – 16 L (class S2) of water per bag of *Diathonite Thermostep.047* used (18 kg – 39.68 lb). Mix for about 4-5 minutes. It is fundamental not to exceed mixing time. Do not mix the product by hand. Never add external compound to the product.

APPLICATION

Application by hand

1. It is **FUNDAMENTAL** to wet the substrate, particularly during summer time and over screeds exposed to the sun.
2. Prepare the area and place Reference bands must be created with woods, aluminium or *Diathonite Thermostep.047* by itself.
3. In case of the reference bands are made

out of *Diathonite Thermostep.047*, wait for the complete dryness of the product. In the case of wooden bands or aluminium profiles, remove the strips immediately after the application of the last coat of *Diathonite Thermostep.047*

4. It is advisable to position the reference bands to a maximum distance of 2.5 meters (8.20 ft) from each other.
5. Check the levelling of the reference bands.
6. Lay down *Diathonite Thermostep.047* taking care to fill in the area between the bands.
7. When the screed drowns piping, it will be necessary to reinforce *Diathonite Thermostep.047* with a galvanized electro welded net. The minimum thickness of the screed above the systems must be at least 3 cm (1.18 inches), and the net must be placed just above the systems. Ensure that the pipes of the systems are adequately sealed. The thickness and the reinforcement of *Diathonite Thermostep.047* must be established according to the expected loads.
8. *Diathonite Thermostep.047* must have a maximum thickness of 5-6 cm (1.97–2.36 in) in a single layer. For larger thickness apply *Diathonite Thermostep.047* in more than one layer.
9. Every following coat must be laid down when the underlying layer is firm to the touch and visually lighter (after approximately 12/24 hours). Wet the screed before applying each layer.
10. Level the screed with a H straightedge, laying on the bands, making a regular and continuous movement. In the getting smoother phase, do not compress *Diathonite Thermostep.047* as per preserve product porosity. As you proceed it is advisable to use a plastic or other material trowel to smooth and compact the surface.
11. For the application on wood, steel supports or panels, it is necessary to use a galvanized metal reinforcement mesh

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for any thickness of *Diathonite Thermostep.047*

Application with plastering machine

Diathonite Thermostep.047 can be laid down with plastering machine for light pre-mixed. Machine setting may be changed according to the machine used. It is possible to use plastering machine (as Turbosol Giotto) in three phases, settled only for the pumping without air and, if necessary, with remote control. Other settings are: use of lung D6-3, wide blade mixer, pipe with a diameter of 35 mm (1.38 inch).

1. It is **fundamental** to wet the substrate especially during summer season and over screeds exposed to the sun.
2. Prepare the area creating reference bands to obtain the required thicknesses. Reference bands must be created with woods, aluminium or *Diathonite Thermostep.047* itself.
3. In case of the reference bands with *Diathonite Thermostep.047*, wait until the complete dryness of the product. In the case of wooden bands or aluminium profiles, remove the bands soon after the application of the last screed coat.
4. It is recommended to place these bands at a maximum distance of 2.5 meters.
5. Check the levelling of the bands with a levelling device.
6. 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 **250-300 L/h** to proceed with the application.
7. Lay down *Diathonite Thermostep.047* filling the area between the bands.
8. When the screed drowns piping, it will be necessary to reinforce *Diathonite Thermostep.047* with a galvanized electro welded net. The minimum thickness of the screed above the systems must be at least 3 cm (1.18 inches), and the net must be placed just above the systems. Ensure that the pipes

- of the systems are adequately sealed.
9. The thickness and the possible reinforcement of *Diathonite Thermostep.047* shall be determined according to the expected loads.
10. The maximum thickness achievable with a single coat is 5/6 cm. For higher thicknesses apply *Diathonite Thermostep.047* in multiple layers.
11. Every following coat must be laid down when the underlying layer is firm to the touch and visually lighter (after approximately 12/24 hours). Wet the screed before applying each layer.
12. Level the screed with a H straightedge, laying on the bands, making a regular and continuous movement. In the getting smoother phase, do not compress *Diathonite Thermostep.047* as per preserve product porosity. As you proceed it is advisable to use a plastic or other material trowel to smooth and compact the surface.
13. For the application on wood, steel supports or panels, it is necessary to use a galvanized metal reinforcement mesh for any thickness of *Diathonite Thermostep.047*

DRYING TIME

At a temperature of 23°C (73.4°F) and relative humidity level of 50%, the product dries in about 28 days if applied with a thickness of 5 cm (1.96 in).

- Drying times are influenced by ambient temperature and relative humidity conditions and can vary significantly.
- Allow approximately 7 to 10 days more per centimetre of thickness, depending on the environmental conditions.
- Protect *Diathonite Thermostep.047* during the curing period from frost, direct sunlight and wind to avoid cracking.
- With high temperature, direct sunlight or strong wind it is necessary to wet the plaster even 2/3 times a day for the next 2/3 days after the application.

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- Once the application has been completed, to avoid damages before the application of the floor, *Diathonite Thermostep.047* must not be subjected to pedestrian traffic or to heavy loads.
- Take care *Diathonite Thermostep.047* has completed its drying shrinkage before the laying of the floor, to avoid cracking.
- Ceramic, terracotta or stoneware tiles can be applied directly on *Diathonite Thermostep.047*
- The screed can be coated even with glued parquet after at least 28 days of curing. If *Diathonite Thermostep.047* is too rough to lay parquet flooring, smooth the surface with a sanding disks machine and apply *WATstop* (see technical data sheet).
- *WATstop* is recommended when it is necessary to consolidate the surface of *Diathonite Thermostep.047*.
- *Diathonite Thermostep.047* is not suitable for radiant panel heating systems, thus floor heating system/pipes cannot be situated into the *Diathonite Thermostep.047* layer. In this case *Diathonite Thermostep.047* must be laid under the floor heating system to avoid possible thermal dispersion.
- *Diathonite Thermostep.047* can be coated with liquid waterproofing or coatings *Diasen* without the use of primers.
- During summer season, apply the product during the cooler hours of the day, away from sun.
- Do not apply with imminent threat of rain or frost, in conditions of strong fog or with relative humidity higher than 70%.
- The application time is about 30-40 minutes, but it may vary depending on temperature and ventilation.
- Outside it is very important to create suitable dilation joints at regular intervals. Joints must be properly realized to avoid cracks and lesions on the final coat.
- Always keep any existing structural and / or expansion and / or insulation joints on the support
- Design suitable joints where there are material changes in the support, fixed elements such as pillars, partitions, doors or thresholds, or changes of casting direction.
- For waterproofing the joints use a sealant such as *Diaseal Strong* (see technical data sheet).
- In special cases (wide distance between pillars, high loads, etc.), use always galvanized metal reinforcement mesh to reinforce *Diathonite Thermostep.047*

SUGGESTIONS

- Environmental and support temperature must be between +5°C and +30°C (+41°F and +95°F).

CLEANING

Wash tools with water before product hardening.

SAFETY

While handling, respect the instructions described in product safety data sheet and always use protective gloves and anti-dust mask.

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* 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	3.90 kg/m ² for each cm of thickness	kg/m ²
	1.92 lb/ft ² per inch of thickness	lb/ft ²
Aspect	powder	-
Colour	grey	-
Grain size	0 - 3	mm
Density	360 kg/m ³	kg/m ³
	22.5 lb/ft ³	lb/ft ³
Water to add to the mixture	0.7 – 0.9 for each 18 kg bag	L/kg
	0.084 – 0.108 for each 18 kg bag (39.68 lb)	gal U.S. / lb
Application temperature	+5 / +30	°C
	+41 / +95	°F
Drying time (T=23°C; R.H. 50%) 5 cm thickness	28	days
Storage	12	months
Packaging	18 kg (39.68 lb) paper bag	kg

Final performances		Unit	Regulation	Results
Thermal conductivity (λ)	0.047	W/mK	UNI EN 12667	-
Specific heat capacity (c)	1000	J/kgK	UNI EN 1745	-
	0.239	kcal/kg °C	UNI EN 10456	-
Attenuation of normalized impact sound pressure level ΔL_w of a system composed by <i>Diafon + Diathonite Thermostep.047</i> (5.0 cm - 1.96 in)	$\Delta L_w = 22$	dB	UNI EN ISO 717-2	-
Footstep insulation index (5 cm <i>Diathonite Thermostep.047 + Diafon + hollow-core concrete floor</i>)	$L'_{nw} = 58$	dB	UNI EN ISO 140-7 DPCM 05.12.1997	-

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Resistance to compression	5.0	MPa	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	-

*** credits valid only for LEED standard for Schools, LEED for Core & Shell, v. 2009.

LEED® Credits		
***Standard LEED for New Construction & Major Renovation, LEED for Schools, LEED for Core & Shell, v. 2009		
Thematic	Credit	Points
Energy & Atmosphere	EAp2 - Minimum energy performance	mandatory
	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*	mandatory
	IEQc3.2 - Construction Indoor Air Quality Management Plan — Before Occupancy	1
	IEQc4.1 - Low Emitting Materials - Adhesives and Sealant	1



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