Demonstration tests
Diasen undertook the first series of tests on cork based plaster as early as 1985.
The aim of our research was to obtain a unique product that would have the best thermal, dehumidifying, sound absorbent and long lasting qualities (when exposed to cold/heat and salt) with easy application.

Durability of Diathonite
All of the materials used in Diathonite production have a life-span of at least 100 years; archaeological findings have even brought to light remains of Roman houses dating back to as far as 2000 years ago, which were insulated with corking. The diatomeic powders and clay, which form the basis of our product, have been accumulated in deposits for thousands of years on our planet.

Technical analysis of components
Cork: the decision to use cork was based on its ability to perform as a finished material, adaptable to, and therefore efficient for, new construction developments. This material is non-toxic, biologically pure, unalterable, waterproofing, breathable, resistant, thermally inert, electrically neutral and non-deformable. It has a good mechanical resistance, low combustion speed and excellent acoustic performances.

Clay: it is a natural porous and light material. It has a good thermal inertia and a good compression resistance, it is highly breathable and resistant to humidity.

Natural hydraulic lime: it is a natural hydraulic binder with high breathability; it is an excellent thermal insulation and it is resistant to thermal shocks. It has an excellent adhesion over any kind of support.

Diatomite or diatomaceous earth: this is a naturally occurring mineral, formed through the accumulation of organic material (cuttlebones, vegetation, etc.), in the ocean floor in prehistoric times. When the water subsided, deposits were distributed in various parts of the earth. Due to its high level of porosity (85%) per volume, diatomite can absorb liquid of up to one and a half times its weight.

Eco friendly additives: obtained by vegetal, they serve to amalgamate the mix, making it more malleable and easier to apply. They give rise to the formation of micro cells, which maintain a high level of permeability to water vapour and increase the thermal resistance of the binder.

Fibres: fibers are easily dispersed in the matrix constituting a homogeneous material able to counteract the plastic shrinkage and the formation of micro-cracks, consequently increasing its resistance. It gives mechanical resistance, a perfect stability over time and they do not release toxic residues.
Diathonite

Qualities and advantages

**Insulation from heat**
Thanks to the presence of cork, the product has the best thermal conductivity ($\lambda$) on the market of thermal plaster.

**Insulation from cold**
Diathonite guarantees good dynamic parameters of thermal lag: up to and more 12 hours depending on the characteristics of the wall.

**Breathable ($\mu = 4$)**
Thanks to the cavernous structure and the thousand of micro and macro porosity that characterizes the structure of the material, Diathonite is highly breathable and it ensures the right hygrometric balance of the building.

**Dehumidifying**
The high capacity of water absorption in combination with the excellent breathability gives to the material an excellent dehumidifying and restoration capacity.

**Elastic**
The presence of lime and the high quantity of cork increases the product elasticity, avoiding the formation of lesions or cracks between beam and pillars.

**Natural**
It is exclusively made of natural materials such as natural hydraulic lime, clay, cork and diatomite.

**Ecofriendly**
It does not contain noxious substances, it contributes to have a healthy environment and it is suitable for refurbishment and green building. Diathonite Evolution plaster is recyclable as inert.

**Acoustic absorption**
The cavernous quality of the material in combination with cork gives to the product excellent acoustic absorption and acoustic insulation features.

**Resistant**
This product guarantees the mechanical resistance and the strength of a plaster.

**Fire resistance**
It has an excellent fire resistance and it is Euroclass A2 following the regulations EN ISO 1716:2012 and EN ISO 1182:2010.
**Diathonite**

Diasen solutions for any kind of problems

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**DIATHONITE EVOLUTION**

**Thermal insulation**

The low thermal conductivity makes the product suitable for thermal insulation of new and old walls and for the correction of thermal bridges. Its lightness and its high elasticity allows interventions of energy upgrading even over existing plasters or over mix masonry.

- Thermal conductivity $\lambda = 0.045 \text{ W/mK}$
- Resistance to vapour diffusion $\mu = 4$ (highly breathable)
- Compression resistance $1.5 \text{ N/mm}^2$
- Fire resistance Euroclass A2
- Elasticity $742 \text{ N/mm}^2$
- Porosity $71.46\%$
- Thermal diffusivity $a = 0.16 \text{ m}^2/\text{Ms}$

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**DIATHONITE PREMIX**

**Acoustic insulation**

Product mass contributes to the improvement of sound proofing performances of exposed walls and partition walls. The cavernosities present into the plaster determines excellent sound absorbing performances able to eliminate echoes and reverberations and to lower the noise of rooms.

- Sound-absorption between 630 and 5000 Hz $\alpha > 0.70$
- Resistance to vapour diffusion $\mu = 4$ (highly breathable)
- Compression resistance $3.0 \text{ N/mm}^2$
- Fire resistance Euroclass A2
- Anhydrous mass weight $470 \text{ kg/m}^3 \pm 30 \text{ kg}$

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**DIATHONITE FOR SCREED**

**Thermal and acoustic screed**

Product suitable to realize insulation screed thanks to its low thermal conductivity and excellent sound proofing performances. Diathonite for Screed is a light material, suitable for sound proofing from footstep and certified to be used as floating screed.

- Thermal conductivity $\lambda = 0.083 \text{ W/mK}$
- Sound-absorption between 630 and 5000 Hz $\alpha > 0.70\%$
- Compression resistance $5.0 \text{ N/mm}^2$
- Fire resistance Euroclass A2
- Anhydrous mass weight $470 \text{ kg/m}^3 \pm 30 \text{ kg}$
**Diathonite**

Diasen solutions for any kind of problems

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**DIATHONITE DEUMIX**

Dehumidifying plaster

Plaster suitable for the restoration of masonry affected by capillary rising dampness. Diathonite Deumix is a completely natural compound and it is suitable where ecofriendly materials are required, in refurbishment and green building.

- Water absorption $0.35 \text{ kg/m}^2 \text{ h}^{0.5}$
- Resistance to vapour diffusion $\mu = 4$ (highly breathable)
- Thermal conductivity $\lambda = 0.080 \text{ W/mK}$
- Dry mortar porosity 65%
- Compression resistance 3.11 N/mm²
- Fire resistance Euroclass A2

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**DIATHONITE REGULARIZATION**

Antisalt regularization

The product is suitable as antisalt barrier in the treatment of humidity problems (rising dampness, bad thermal insulation, ...), helping and enhancing the action of the dehumidifying plaster. The product is developed for green building intervention and in refurbishment where it is necessary to guarantee the breathability of the wall and the use of natural materials.

- Resistance to vapour diffusion $\mu < 8$ (highly breathable)
- Salt resistance Excellent
- Compression resistance 4.3 N/mm²
- Fire resistance Euroclass A1
- Anhydrous mass weight 1230 kg/m³

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**DIATHONITE 0/3**

Thermal and acoustic insulation

Compound to be mixed with cement or hydraulic lime and water to realize a thermal, dehumidifying, soundproofing and sound absorbing plaster. The low thermal conductivity makes the product suitable for the thermal insulation of walls and for the correction of thermal bridges. Its mass and porosity contribute to the improvement of soundproofing and sound absorption performances of exposed walls and partition walls.

- Thermal conductivity $\lambda = 0.083 \text{ W/mK}$
- Sound-absorption between 630 and 5000 Hz $\alpha > 0.70\%$
- Resistance to vapour diffusion $\mu = 4$ (highly breathable)
- Compression resistance 3.0 N/mm²
- Fire resistance Euroclass A2
Diathonite Evolution

One product, multiple solutions

Direct application
- External coloured finishing
  - PLASTERPAINT COLOURED
  - ARGACEM COLOURED
  - ACRILID PROTECT COATING

Internal finishing
- C.W.C. Stop Condense
- LIMEPAINT

DIATHONITE EVOLUTION + ARGACEM Smoother

Brick
- Mixed masonry
- Solid masonry

DIRECT APPLICATION

Beam and pillars
- Concrete
- Old smooth plaster

AQUABOND
Diathonite Evolution

Diathonite Evolution is a premixed plaster formulated with pure natural hydraulic lime NHL 3.5, clay, diatomite and reinforcement fibres. It has high insulation power, it is sound absorbant and breathable. The product is also a completely natural compound and it is suitable wherever ecofriendly products are required. The plaster is recyclable as inert. Diathonite Evolution is the first and real cork based plaster, with CE certification, suitable to realize, both internally and externally, of thermal insulation, dehumidification, energy upgrading and sound absorbant coatings. It is the only product that combines the characteristics of insulation from cold thanks to cork with the one of insulation from heat of the stones. Thanks to the high breathability and its high capacity of water absorption, Diathonite Evolution is an excellent natural restoring product that resolves, in just one intervention, humidity problems and thermal insulation.

**Thermal conductivity** $\lambda = 0.045$ W/mK
Diathonite Evolution presents the best values of thermal conductivity in the range of thermal plaster.

**Breathability** $\mu = 4$
Diathonite Evolution is a highly breathable plaster that let the wall breathe.

**Mechanical resistance** 1.5 N/mm²
Diathonite Evolution gives to the wall a higher consistency, resistance and solidity.

**Dehumidifying capacity** = 0.35 Kg/m²h⁰.⁵
Diathonite Evolution dissipates any moisture present into the masonry.

**Natural and ecofriendly**
Diathonite Evolution is exclusively made of natural compound and it can be used in historical refurbishment intervention and in green building projects.

**Insulation from heat** ($\alpha = 0.16$ m²/Ms)
Diathonite Evolution, thanks to its low diffusivity value ($\alpha$), insulate also from heat compared to traditional dry systems.
Diathonite® Evolution

Thermal insulation

Diathonite is an ideal plaster to realize thermal insulation in combination with any kind of perforated bricks.

Faster building system
It is possible to overcome all the application difficulties typical of the fixing of dry systems or of empty walls, allowing a less number of works and thus a high saving of labor.

Energetic saving
It avoids thermal winter loss and over heating during summer, thus limiting the use of heating systems or air conditioning, favouring energy savings all year round.

Higher thermal comfort
It keeps a uniform temperature during winter and summer season, avoiding discomfort for sudden changes of temperature.

Absence of condensation
It avoids the formation of interstitial and superficial condensation, thus eliminating the formation of mould over thermal bridges or exposed walls.

Increasing building durability
The external coating guarantees an excellent resistance to weathering agents, to ice, to thermal shocks and it allows to reduce easily thermal dilatations between construction materials, and increases their durability over years.

Building revaluation
The use of Diathonite Evolution makes the building suitable to have energy certification, increasing the commercial value of the building.

Tax benefit
Diathonite Evolution thermal plaster enables to get the tax benefits for energetic building revaluation.

Thermal coating insulation advantages

1. Plasterpaint coloured/Argacem coloured
2. Argacem HP smoother
3. Diathonite Evolution
4. Aquabond
Advantages of insulate with Diathonite Evolution plaster

Breathable plaster
Diathonite is highly breathable and it contributes to the well being of indoor environment, limiting condensation phenomena.

Building in accordance with nature
Diathonite is an ecological and natural product, non-pollutant both at the production and disposal stage. It is packaged in easy-to-dispose paper bags.

Lack of lesions
The high elasticity of the material and the continuity during application phase avoid the formation of any cracks or lesions.

Protection from heat
Thanks to the high density (360 kg/mq) and the specific heat, Diathonite is an excellent solution to insulate buildings from heat, giving to masonry excellent thermal lag parameters and limiting energy consumption for summer air-conditioning.

High resistance
The product gives a high mechanical and fire resistance to the wall.

A wall according to the law
Using Diathonite it is easy to realize wall-systems respecting thermal, acoustic and seismic national laws.

Excellent energy saving
Using Diathonite Evolution allows to insulate from heat and cold, thus favouring energy savings both for winter heating and summer air conditioning, maximizing living comfort all year round.

Humidity restoration
Diathonite Evolution plaster is the only product with both thermal and dehumidifying qualities.

Ideal for inside and outside
Thanks to the plaster versatility it is possible to work both on the external and internal wall, dividing the thicknesses where it is necessary.
Protection from heat

Diathonite, thanks to its physical characteristics such as a low thermal conductivity ($\lambda$), a high specific heat capacity and a high density, it is a product that is able to contain the outside heat wave and then allows a considerable energy savings in summer air conditioning.

The global parameter to assess the ability of a material to reduce the thermal summer wave is the thermal diffusivity, which can be represented by the “propagation speed” of the energy in the material. The thermal diffusivity $a$ [m$^2$/Ms] is evaluated as:

$$a = \frac{\lambda}{\rho \cdot c}$$

where $\lambda$ stands for thermal conductivity, $\rho$ is the density of the material and $c$ is the specific heat.

The low value of thermal diffusivity of Diathonite Evolution improves the behavior of structures during summer. But choosing the right material how do I evaluate the entire structure?

A structure that behaves well during summer season has adequate values of periodic thermal transmittance $Y_{te}$, thermal lag $\varphi$ and attenuation $f_a$, and it is able to contain the effects of surface temperature oscillation caused by solar radiation and outside air temperature.

<table>
<thead>
<tr>
<th>Material</th>
<th>Density $\rho$ (kg/m$^3$)</th>
<th>Specific heat $c$ (J/kg K)</th>
<th>Thermal conductivity $\lambda$ (W/mK)</th>
<th>Thermal diffusivity $a$ (m$^2$/Ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diathonite Evolution</td>
<td>290</td>
<td>1000</td>
<td>0,045</td>
<td>0,16</td>
</tr>
<tr>
<td>Plaster UNI EN 1745</td>
<td>250</td>
<td>1000</td>
<td>0,080</td>
<td>0,32</td>
</tr>
</tbody>
</table>

The left image shows the behavior of the wall during summer season; the external superficial temperature of the wall (in red), thanks the effect of air temperature (in black) and solar radiation causes a heat wave which can be more or less intense according to the characteristics of the structure.

In reference to national guidelines for energy certification of buildings (DM 26.06.2009), thermal lag and attenuation parameters can determine the summer performance characteristics of structures as listed below:

<table>
<thead>
<tr>
<th>Thermal lag $\varphi$ (hours)</th>
<th>Attenuation $f_a$</th>
<th>Performances</th>
<th>Performance quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\varphi &gt; 12$</td>
<td>$f_a &lt; 0.15$</td>
<td>excellent</td>
<td>I</td>
</tr>
<tr>
<td>$12 \leq \varphi &lt; 10$</td>
<td>$0.15 \leq f_a &lt; 0.30$</td>
<td>good</td>
<td>II</td>
</tr>
<tr>
<td>$10 \leq \varphi &lt; 8$</td>
<td>$0.30 \leq f_a &lt; 0.40$</td>
<td>medium</td>
<td>III</td>
</tr>
<tr>
<td>$8 \leq \varphi &lt; 6$</td>
<td>$0.40 \leq f_a &lt; 0.60$</td>
<td>sufficient</td>
<td>IV</td>
</tr>
<tr>
<td>$\varphi &lt; 6$</td>
<td>$f_a \geq 0.60$</td>
<td>mediocre</td>
<td>V</td>
</tr>
</tbody>
</table>

In warmer locations, in presence of strong sunlight, the Presidential Decree 59/09 requires a periodic thermal transmittance ($Y_{te}$) lower than 0.12. For further details and for the method of calculation of parameters of thermal lag and attenuation, please refer to UNI EN 13786..
Protection from heat

As shown by calculations done and reported on the table the wall insulated with Diathonite Evolution has excellent performance to get the summer energy certification.

An existing wall made of brick and energetically corrected using 5 cm of Diathonite Evolution applied inside allows the structure to achieve good performance in insulation from heat.

Comparing the values of the table on the previous page with the table above it is possible to see how the different use of Diathonite Evolution affect the behavior of the structure.

Applying the plaster inside you get a thermal lag of 12 hours and 46 minutes and an attenuation of 16%. The structure thus insulated has a good behavior with respect to heat insulation. The use of Diathonite Evolution outside the wall or applying a combination of internal and external insulation allows to achieve excellent levels of insulation from heat. It is thus possible to obtain a thermal lag of 13 hours and a half and an attenuation of 5%.
Correction of thermal bridges

The existence of thermal bridges is one of the biggest problems in modern construction. The principal causes of thermal bridges are:
- the existence of many different kind of materials in a building
- lack of homogeneity and geometrical discontinuity in the structure
- interruption of the insulation coat

The use of a thermal insulation realized with Diathonite Evolution allows to obtain a system that easily avoid these potential mistakes.

Diathonite Evolution system advantages

- **Avoid heat losses**
  Diathonite Evolution system avoids a wrong insulation of thermal bridges, that usually causes heat losses reaching even 40% of total thermal dispersions of the building.

- **Avoid condensation and mould**
  Thermal bridges insulation allow to avoid the formation of condense and mould.

- **Avoid damages to the structure**
  The insulation system avoids that the cyclical variations in surface temperatures could cause the pulverization of construction material.

- **Improving thermal comfort**
  This system increases the internal wall temperature of about 2-3°C during winter season, thus avoiding the typical uncomfortable feeling caused by the difference of temperature between the wall and the environment that causes energy waste.

- **Keep a uniform external or internal surface**
  The versatility of the plaster allows to level perfectly every wall, in case of refurbishment or in new constructions.

- **Easy insulation on thermal bridges**
  Applying our thermal plaster is guaranteed a continuity of the insulating material and the correct thickness for the insulation of thermal bridge.
Correction of thermal bridges

Technical solution

To correct a thermal bridge made up of concrete pillars and to comply with the limit posed by national legislation, it is necessary to raise the thickness of the thermal insulation.

The solution offered by Diasen with Diathonite Evolution consists in providing for a groove between pillar and curtain element of about minimum 3 cm at the designing stage. This allows to reach the 7 cm of insulation needed for thermal correction in pillars and separators, thus preventing any difficult-to-solve building problems in operating conditions.

To improve the pillar adhesion of Diathonite Evolution we recommend the use of Aquabond, a primer that is able to make the surface rough and to solve problems related to form release agents, thus obtaining a good anchoring of the plaster.

Thermohygrometry verification

\[ U_{PT} = U_{regulation} - (U_{wall} \times 0.8) \]

Thermal transmittance to respect at the thermal bridge according to national current regulations.

Software for thermal calculation

Diatherm is a software developed by DIASEN I.T. Dept. to make thermal analysis and thermal-hygrometric verification according to the standards of current regulations and laws.

In Diatherm you can find many pre-set libraries of most common building materials: bricks, concrete, mortars, plasters and insulating materials.

Furthermore Diatherm allows to add personal materials with which you can realize your custom thermal hygrometric analysis. Diatherm can be downloaded from DIASEN website totally for free.
Refurbishment
Application directly over old plaster

Diathonite Evolution can be applied directly onto the old plaster in good condition. If the substrate over which you have to work has an absorbency degree equal to zero or very low, the correct adhesion of Diathonite is guaranteed by using a special primer, Aquabond.

Advantages of using Diathonite Evolution in refurbishment

External wall protection
Diathonite Evolution protects the building wrapping the whole structure and stopping the deterioration.

Avoiding cracks formation
Diathonite Evolution avoids and prevents any crack problems.

Humidity rehabilitation
Diathonite Evolution system can restore the walls eventually affected by rising dampness problems.

Maximum protection
It is now possible to avoid meteoric water infiltrations and the eventual formation of internal or interstitial condenses.

Saving on building costs
Diathonite Evolution, unlike dry systems, allows an easier and faster application over existing walls, thus drastically reducing building and working costs.

Increasing the commercial value of the building
The façade refurbishment, in combination with thermal insulation, increases considerably the commercial value of the building.

Wall regularization
Diathonite Evolution allows the application of the external coating even if the wall shows different thickness levels.
Energy requalification of old buildings

Diathonite Evolution system is suitable for energy revaluation of old buildings due to its versatility, its lightness, its high breathability, its mechanical resistance and its high thermal properties, also for historic refurbishment and green building.

Advantages of requalification using Diathonite Evolution

A higher thickness to respect transmittance limit imposed by DPR 59/09
Using Diathonite Evolution it is possible to apply high levels of thickness, to reach the U value required by law, and to correct any thermal bridge avoiding installation problems.

Plumbed walls
Diathonite Evolution allows to adhere over any kind of old surfaces and it allows to plumb old walls, using different levels of thickness onto the whole wall.

Inside and outside application
In presence of high thickness it is possible to divide the insulation layer both inside and outside of the wall.

Breathability assurance
Diathonite is a highly breathable material, used to prevent and solve the formation of condensation and mould, ensuring an excellent comfort inside the house.

Tax benefits
Possibility to obtain tax benefits (according to the laws of each country).

Great adhesion on every kind of surface
Diathonite Evolution system could be applied over every type of old masonry: stone, old plasters, mixed, facades.

Diathonite Evolution applied inside
Diathonite Evolution adapt itself perfectly to many thermal insulation techniques. Very often in fact working from the inside it is the only possible solution, for example in case of stone or brick masonry that have to remain exposed or need to be as in their original aspect.
The insulation of the internal wall is moreover an excellent solution in case of environment non always used, since it allows the reaching of the optimum inside temperature in few time (such as: holiday houses, hotels, recreational buildings, schools...).
Diathonite Deumix

The complete range of dehumidifying products

**Highly breathable**

$\mu = 4$

The high breathability contributes to the dehumidifying action and to the creation of a healthy and comfortable environment.

**Dehumidifying properties**

$0.35 \text{ kg/m}^2 \text{ h}^{0.5}$

Diathonite Deumix plaster is able to dispose of 1 liter of water per square meter every hour.

**NHL 5**

UNI-EN 459-1

The presence of lime NHL 5 gives to the plaster high workability characteristics, mechanical resistances and a low tendency to form mould and efflorescences.

**Thermal class T1**

$\lambda = 0.080$ W/mK

Diathonite Deumix is the only plaster that has restoration and dehumidifying properties, combined with thermal insulation characteristics.

**Dehumidifying, breathable, eco friendly and thermal plaster**

Diathonite Deumix is a premixed plaster with dehumidifying properties and fiber reinforced with cork (gran. 0-4 mm), natural hydraulic lime NHL 5, clay and diatomite. The compound is natural and ecofriendly since it is cement free. It can be used both inside and outside, it is ideal to realize dehumidification intervention and to restore masonry affected by rising dampness.

Besides dehumidification properties, this product is characterized by its high thermal insulation power that allows to limit the formation of interstitial condensation and thus the quantity of humidity to dispose of.

The product is suitable for any salinity problems, it respects the thermo-hygrometric equilibrium of the support and it is perfectly compatible with mineral coatings made of lime and silicates. Diathonite Deumix, moreover, has a good fire resistance and it belongs to Euroclass A2 according to EN ISO 1716:2010 and EN ISO 1182:2010.
Dehumidifying system

How does humidity generate in the walls?

The accumulation of humidity in the walls causes many problems that appear with the alteration of the building structure mainly for physical and / or chemical reasons. Diasen dehumidifying system involves the use of a range of products which solve these problems depending on the degree of humidity of the walls and the type of intervention to realize.

The first step consists in the identification of the origin of moisture:

a) moisture caused by rising damp from the ground or by the pressure of the ground;

b) atmospheric humidity present in non adequately insulated places, which is transformed into moisture (with the consequent formation of mould);

c) residual humidity that can affect both new and old buildings that are characterized by thick masonry;

d) humidity due to incorrect draining due to design and / or construction mistakes that can cause water penetration in walls, floors, etc.;

e) humidity resulting from breakage of technological systems such as downpipe, descendants, various pipes, etc.

Why intervene?

The main adverse effects due to humidity are:

- **Static damages**
  - Walls affected by rising damp are subject to deteriorating pressures due to water freezing caused by low temperatures;
  - Chemical reactions between salts transported by water due to humidity and those present in the masonry produce alterations inside the structure and plaster.

- **Economical damages**
  - Increase of heat loss from inside the building;
  - Cooler masonry where it may occur condensation;
  - Higher consumption of winter heating.

- **Aesthetic damages**
  - Detachment of the plaster and erosion of connection mortar;
  - Detachment of the superficial layer in some stones and bricks as a result of the crystallization of salts;
  - Formation of stains and molds that create an unhealthy environment;
  - Swelling and detachment of the final coat.

- **Health damages**
  - Formation of mould that creates an unhealthy environment;
  - Increase in the case studies of allergic reactions and respiratory diseases;
  - The high level of humidity inside a room rises the discomfort.

La soluzione Diasen

Diasen has produced Diathonite for 25 years and it has developed Diathonite Deumix, the first dehumidifying breathable and insulation plaster made of cork, the only plaster that besides dehumidifying system involves thermal insulation capacities.

**Diathonite Deumix**

Dehumidifying natural plaster, based on natural hydraulic lime NHL 5, cork, clay and diathomic powders, that solves definitively rising dampness problems and saltpetre.

Thanks to its high breathability and dehumidifying properties, Diathonite Deumix restore walls and it contributes to a healthy environment. Diathonite Deumix is moreover the only dehumidifying plaster that combines restoration capacities with the one of thermal insulation, avoiding the formation of interstitial condensation and limiting the quantity of humidity to dispose of.

**Diathonite Regularization**

Premixed mortar based on natural hydraulic lime and mineral aggregates selected with a suitable grain size, to use as antisalt treatment for masonry. Thanks to the presence of a natural active principle, Diathonite Regularization stops the passage of salts and it avoids a new formation, thus allowing the passage of water steam that will be successively disposed by Diathonite Deumix.

**WATstop**

Strengthener for deteriorated masonry by the disruptive action of humidity, used to prepare the support for the application of Diathonite Regularization and / or Diathonite Deumix to complete the dehumidifying cycle when it is necessary to intervene on walls in contact with the ground.
Diasen solutions against humidity

Inside dehumidification of a wall in contact with the ground

1) WATstop - strengthener for countethrust.
2) Diathonite Deumix - dehumidifying plaster with thermal insulation characteristics.

Diasen system includes the use of WATstop to consolidate the wall damaged by the high pressure of humidity. **Diathonite Deumix** is useful to regularize the level of humidity inside the room, guaranteeing a good thermal insulation too. The plaster is based on lime and natural aggregates such as clay and cork, suitably selected on the granulometric curve in order to obtain a material with characteristics of internal macroporosity. Thanks to the presence of lime NHL 5, the product has the following characteristics: plasticity, workability, greater flexibility and resilience, low tendency to form efflorescence, high breathability.

\[ \mu = 4 \text{ (Highly breathable)} \]
\[ \lambda = 0.080 \text{ W/mK (Good thermal insulation)} \]

Inside dehumidification of a basement wall

1) WATstop - strengthener for countethrust.
2) Diathonite Deumix - dehumidifying plaster with thermal insulation characteristics.
3) Diathonite Regularization - dehumidifying regularization with anti salt barrier properties.

The system includes the use of WATstop to consolidate the wall damaged by the high pressure of humidity. **Diathonite Regularization** is a premixed mortar based on hydraulic lime and mineral aggregates. It forms a basis for the preparation of the support over which the dehumidifying plaster will be applied. Its antisalt barrier function is an adjuvant in the treatment of humidity related problems, helping and enhancing the dehumidifying action of the plaster. It works as barrier against salts eventually present into the masonry above the ground level line. **Diathonite Deumix** it is useful to adjust the level of humidity inside the room providing also a thermal insulation (\( \lambda = 0.080 \text{ W/mK} \)).
Diasen solutions against humidity

Dehumidification from inside or outside in presence of salt efflorescence

1) Salt efflorescence.  
2) Diathonite Regularization - dehumidifying regularization with anti salt barrier properties.  
3) Diathonite Deumix - dehumidifying plaster with thermal insulation characteristics.

Diasen system includes the use of Diathonite Regularization that thanks to the presence of an active mineral it prevents the crystallization of the salt inside the masonry and thus it avoids the formation of new salt efflorescence. Diathonite Deumix is used to dehumidify the structure thanks to the presence of natural hydraulic lime, the excellent value of μ = 4 and the high percentage of porosity of the product. The plaster thus guarantees the achievement of the thermal hugrometric balance of the environments, increasing moreover the level of thermal insulation of masonry.

Dehumidification from inside or outside without salt efflorescence

1) Diathonite Deumix - dehumidifying plaster with thermal insulation characteristics.

The system includes the only use of Diathonite Deumix to be used only on walls affected by humidity without the presence of salt efflorescence. Thanks to the presence of natural hydraulic lime NHL 5 and to its particular micro and macro porous, Diathonite Deumix is characterised by an excellent dehumidifying value (μ = 4) in combination with a high capacity of water absorption equal to 0,35 kg/m² h⁰⁵. 

Diathonite Deumix is thus able to drain up to 1 liter of water per square meter every hour. The dehumidifying action is completed moreover with good thermal performances of the product, that avoids the formation of interstitial condensation reducing the quantity of humidity to drain. The use of Diathonite Deumix plaster allows, in just one intervention, to requalificate the wall contributing to the rising living comfort of a healthy and comfortable place.
Thermohygrometry

The Italian thermal regulation sets a maximum value (UNI EN 13788) of interstitial condensation under which the humidity is considered drained by the structure (500 g/m²). Values of humidity higher than 500 g/m² makes the wall not in compliance with the regulations. It is thus very important to analyse the hygrometric behaviour of perimetal walls.

The presence of human being with his natural activity (breathing, physical activities, vapour production inside the kitchen and bathroom), inevitably rises the level of humidity inside a place. The scarce ventilation of rooms and the use of last generation windows rises the risk of condensation formation inside the wall, and it is fundamental that the walls contribute to the drainage of internal humidity.

By varying the temperature and pressure between two environments separated by a wall (room and outside) is generated a flow of steam that from the environment with greater concentration of moisture (internal environment) will tend to move towards the environment with a lower humidity (external environment). If inside the wall there is a layer of material with a low breathability value (for eg. polystyrenes, vapor barriers, plastic trim) the steam flow is inevitably interrupted with the consequent formation of interstitial condensation.

The presence of moisture causes phenomena of interstitial disintegration and deterioration of building materials but also drastically decreases the thermal performance of the wall. It is therefore essential that the wall has the adequate characteristics to enable the correct outflow of steam.

Diathonite Deumix plaster, thanks to its breathability features $(\mu=4)$ and to its peculiar porous structure, allows the correct flow of steam. Its dehumidifying capacity, guarantee a rapid disposal of moisture (0.35 Kg/m²h⁰), reducing to a minimum the time of permanence of the latter inside the masonry. Moreover, thanks to the thermal conductivity value $(\lambda = 0.080 \text{ W/mK})$ Diathonite Deumix avoids the possible formation of interstitial and superficial condensation. The high higrometric characteristics (breathability and the ability to absorb and release steam) of Diathonite Deumix allows the system to prevent and avoid the formation of condensation. Diathonite Deumix plaster acts as a sponge and regulates the thermal hygrometric balance of interior environments.
Thermohygrometry

**Glaser analysis**

To verify the right hygrometric behaviour of the wall different kind of software was used (such as Diatherm PRO - see page 13) that, based on Glaser analysis, identify eventual problems in the flow of steam through the structure.

Example 1: Glaser analysis of a wall made of traditional internal plaster + brick + traditional external plaster. In this case the vapour pressure line and the saturation pressure line meet in two points thus creates interstitial condensation.

Example 2: Glaser analysis of a wall made of a breathable internal plaster + brick + Diathonite Deumix externally. In this case the saturation pressure line remains above the vapour pressure line. This stratigraphy does not present neither interstitial nor superficial condensation, allowing a correct outflow of vapour through the materials.

**Diathonite has a hygrometric lung**

<table>
<thead>
<tr>
<th>Diathonite is a highly breathable material and vapour permeable μ=4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>This important feature related to the peculiar porous structure of the material, characterized by the presence of many hollowness connected to each other.</td>
</tr>
<tr>
<td>Diathonite is able to absorb and release water vapour, about 0.35 Kg per m² in half an hour.</td>
</tr>
<tr>
<td>This peculiarity allows to absorb and release rapidly water steam avoiding the stay of superficial humidity that brings to mould formation.</td>
</tr>
<tr>
<td>The combination of such qualities makes Diathonite system particularly suitable against superficial condense and mould formation.</td>
</tr>
</tbody>
</table>
Diasen solutions for acoustic insulation

**Acoustic, sound absorbing, breathable and thermal plaster**

Diathonite Premix is a premixed plaster fiber reinforced with cork (gran. 0-3 mm), clay, diatomite and natural hydraulic lime NHL 3,5, to use for the realization of sound absorbing coating (theaters, conference rooms, ...) and for the acoustic insulation of facades and partition walls.

The compound is ready to use, both inside and outside, it has excellent sound absorbing properties (it absorbs 76% of sound wave), high breathability and a good fire resistance.

Besides acoustic insulation and sound absorbing characteristics, Diathonite Premix has good thermal insulation features and high dehumidification properties.

Moreover the plaster can be applied by pump in an easy and fast way, it does not crack between the pillar and the wall.
Diathonite Premix, thanks to the large amount of hollows and holes that characterizes the structure, claims sound absorbing values that are higher if compared to a standard plaster. It can thus absorb effectively sound waves, eliminating the problem of reverberation and improving the acoustic quality of building.

**Acoustic absorption level higher than 65% between 630 and 5000 Hz**

Thanks to its cavernous quality, Diathonite Premix has a high level of acoustic absorption ($\alpha = 0.65$ between 630 and 5000 Hz).

The sound absorption index of a material is particularly important in acoustic architectural design and indicates whether a material is capable of reducing the impact of noise levels in acoustically “polluted” environments.

The absorption coefficient of Diathonite Premix $\alpha = 0.76$ at 800Hz means that the plaster is able to absorb 76% of sound wave, reflecting into the environment only the rest 24%.

<table>
<thead>
<tr>
<th>Frequency (Hz)</th>
<th>Acoustic absorption coefficient ($\alpha$)</th>
<th>Frequency (Hz)</th>
<th>Acoustic absorption coefficient ($\alpha$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>19%</td>
<td>800</td>
<td>76%</td>
</tr>
<tr>
<td>125</td>
<td>16%</td>
<td>1000</td>
<td>74%</td>
</tr>
<tr>
<td>160</td>
<td>8%</td>
<td>1250</td>
<td>75%</td>
</tr>
<tr>
<td>200</td>
<td>33%</td>
<td>1600</td>
<td>69%</td>
</tr>
<tr>
<td>250</td>
<td>28%</td>
<td>2000</td>
<td>66%</td>
</tr>
<tr>
<td>315</td>
<td>43%</td>
<td>2500</td>
<td>66%</td>
</tr>
<tr>
<td>400</td>
<td>51%</td>
<td>3150</td>
<td>68%</td>
</tr>
<tr>
<td>500</td>
<td>63%</td>
<td>4000</td>
<td>71%</td>
</tr>
<tr>
<td>630</td>
<td>75%</td>
<td>5000</td>
<td>66%</td>
</tr>
</tbody>
</table>

The list shows the sound absorption as related to different sound frequencies.

**Elimination of reverberation**

**What is reverberation?**

The high index of acoustic absorption allows to eliminate reverberation, that is the persistence of sound even when the source has ceased to emit it.

This phenomenon can be extremely irritating if the overlap of reverberated and original sound interferes excessively with newly generated sound, masking and obscuring overall sound recognition. It can be equally irritating if reverberated sound is too short, causing disjointed sound.

The importance of a correct diffusion of sound is essential in auditorium, conference rooms, theaters and classrooms in general.

**How does Diathonite eliminate reverberation?**

Diathonite Premix, thanks to its air-opened cells structure, is able to absorb and deaden the sound wave: at certain frequency more than 76% of sound wave is absorbed and dissipated.

Diathonite Premix plaster allowed to reduce sound reflections

The high sound absorbing capacity of Diathonite Premix makes possible to use it also on road works, where the plaster was used to reduce the reflection of sound waves on houses near the concrete walls of the highway.
In Italy acoustic regulation in construction is ruled by Law 447/95 “Regulation concerning the acoustic pollution” and in particular DPCM 5-12-1997 “Determination of passive acoustic requirements of buildings”.

**Acoustic parameter in construction**

\[ R'_{w} \] = it measures the sound insulation capacity of room partitions. Lateral sound transmission must also be considered, which is the sound depression in dB, as sound travels through walls. The higher this level is, the better the sound absorption.

\[ L'_{nw} \] = it represents a variation in the standardised level of footfall sound, that is, the level of passing noise. The lower it is the better.

\[ D_{m,nT,w} \] = façade standard acoustic insulation index. It expresses the insulation of external cladding and depends on the acoustic properties of the various elements that compose it.

**The good acoustic builder rules**

- The block wall (if without groove junction) has to be fixed applying the mortar on the all four junctions (both horizontally and vertically). No join sliding has to be present between the two rooms.
- Electrical chases and boxes on the wall must be carefully plastered over using mortar based on sand and cement.
- All screeds must be floating and, such as ceiling plaster, must be realized afterwards the vertical wall plastering.
- Architectonical nodes have to be free from the whole building structure; or rather the boarding walls must be broken from the rooms by partition walls.

### Classification of different buildings and limit values as of DPCM 5-12-1997 (data in dB)

<table>
<thead>
<tr>
<th></th>
<th>( R'_{w} )</th>
<th>( L'_{nw} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals, clinics, old people houses and similar buildings</td>
<td>55</td>
<td>58</td>
</tr>
<tr>
<td>Residential and similar buildings</td>
<td>50</td>
<td>63</td>
</tr>
<tr>
<td>Hotels, bed and breakfast and similar</td>
<td>50</td>
<td>63</td>
</tr>
<tr>
<td>School / college buildings and similar</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td>Buildings used for offices or similar activities</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>Buildings used for recreational, worship or similar activities</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>Buildings used for commercial or similar activities</td>
<td>50</td>
<td>55</td>
</tr>
</tbody>
</table>

**Thermal and acoustic insulation for facades**

A wall insulated externally with Diathonite Premix with the following stratigraphy:

<table>
<thead>
<tr>
<th></th>
<th>Thickness [cm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diathonite Premix</td>
<td>3</td>
</tr>
<tr>
<td>Thermal brick</td>
<td>25</td>
</tr>
<tr>
<td>Internal plaster</td>
<td>1.5</td>
</tr>
</tbody>
</table>

It is characterized by the following performances:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sound insulation index ( R_{w} )</td>
<td>59 dB</td>
</tr>
<tr>
<td>Facade acoustic insulation index ( D_{m,nT,w} )</td>
<td>46 dB</td>
</tr>
</tbody>
</table>

\( (*) = \) measured according to UNI EN ISO 140/3
\( (**) = \) performed Microbel S.r.l. (Torino) according to ISO 140-5
For further technical information please contact Diasen technical office.
Acoustic insulation of partition walls

The peculiar porous structure of the material, the high quantity of cork content in combination with its high mass, particularly in relation to that of traditional insulating panel, make the use of Diathonite Premix the ideal solution to realize partition walls between different building units. In this way it becomes easy to avoid any kind of “acoustic bridge” between bricks, increasing the sound-dissipation effect and rising the acoustic performances of buildings.

Benefits of acoustic insulation with Diathonite Premix

**Faster application**
The insulation of partition walls with Diathonite Premix allows to build up a wall in just two steps: bedding of the brick, application of the plaster on both faces.

**Cost savings**
Diathonite Premix plaster works both as acoustic insulation and as plaster for indoor, and it allows to lower costs of both material needed and work for the application.

**Reduction of probabilities of committing mistakes**
The continuous application and the homogeneity of Diathonite Premix avoid the possibility of creating acoustic bridges due to human mistakes.

**Increasing of insulating power**
The use of Diathonite Premix allows to realize a partition wall that insulate thermically, avoiding heat losses in case of adjacent uninhabited apartments.

Acoustic insulation of partition walls on separated building units:
Results of an acoustic test made by a qualified acoustic technical operator*  

<table>
<thead>
<tr>
<th>Materials</th>
<th>Thickness</th>
<th>Soundproofing capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diathonite</td>
<td>cm 2</td>
<td></td>
</tr>
<tr>
<td>Thermal brick**</td>
<td>cm 25</td>
<td>$R_w' = 51$ dB</td>
</tr>
<tr>
<td>Diathonite</td>
<td>cm 2</td>
<td>$R_w' = 51$ dB</td>
</tr>
</tbody>
</table>
Diathonite for Screed

Diasen screed system + waterproofing

**Acoustic, sound absorption, breathable and thermal screed**

Diathonite for Screed is a premixed fiber reinforced screed with cork (gran. 0-3 mm), clay, diatomite and natural hydraulic lime NHL 3.5, to be used for the realization of lightened thermal screed, for the thermal insulation and sound insulation from trampling of attic, floors and ventilated roofs. Being a lightened insulation it allows to thermally and acoustically insulate without weighting down attics and existing structures. Diathonite for Screed can be used both inside and outside, on new buildings and for refurbishment.

The compound is ready to be used, it has a high breathability and a good fire resistance. Moreover Diathonite for Screed is a completely natural and eco friendly material, and it can be used for green building intervention and on historical refurbishment.
In addition to standard air carried noise, floors are subjected to noises from the collision of solid objects (footfall, movement of furniture, falling objects). Thanks to the high level of mechanical resistance, to the acoustic features, breathability and thermal properties, Diathonite for Screed is the ideal solution to realize lightened screed on attics, insulated and ventilated roofs.

Benefits of a screed realised with Diathonite

**Direct tiling over the screed**
Tiles can be applied directly on it, avoiding realisation of another cement screed.

**Lightweight solution**
Diathonite for Screed lightness allows not to weight down the loft, a very important feature both in refurbishment and in the construction of new building.

**Mechanical resistance**
A screed realised with Diathonite for Screed guarantees a high level of mechanical resistance.

**Direct waterproofing**
Diathonite for Screed, if realised outdoor, can be waterproofed directly with Diasen waterproofing systems.

**Solution for different level of thickness**
Diathonite for Screed allows to intervene realizing variable thicknesses, depending on the characteristics of the existing support. This requirement is particularly important in refurbishment work.

**Direct application on old floors**
Diathonite for Screed can also be applied directly on old screeds or tiles.

**Easy application**
Diathonite for screed can be applied as a normal screed.

**Improvement of thermal and acoustic performances**
Diathonite for Screed, thanks to its characteristics, contributes to enhance both the performances of thermal insulation and the one of acoustic insulation of loft between different building unit.
A screed realised with Diathonite for Screed, combined with Diafon soundproofing mat and correctly applied, allows to comply with the acoustic performances required by law, ensuring an optimum level of thermal insulation. Diathonite for Screed features allow to work also with low thicknesses, without weight down the loft, offering an excellent solution for refurbishment works.

<table>
<thead>
<tr>
<th>Diathonite for Screed 50 mm + Diafon mat 2,5 mm + Tiles</th>
<th>Diathonite for Screed 50 mm + Diafon mat 5,0 mm + Tiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L'_{nw} = 58 \text{ dB} (*)$</td>
<td>$L'_{nw} = 56 \text{ dB} (*)$</td>
</tr>
</tbody>
</table>

(*) The results are referred to measurement taken once applied. They certificare the effectiveness of Diasen products for the insulation of noises derived from trampling also in presence of rigid coatings such as tiles. For further technical information please contact Diasen technical office.

**Suggestions for a good insulation from trampling**

1. There should be no rigid points of contact with underlying flooring and the walls.
2. Piping, wiring etc. should be fixed to the floor with cement mortar.
3. DiaFon must be applied over a clean, well levelled and without any residual that could generate “acoustic bridges”.

**Diasen’s system for waterproofing and sound insulation from trampling**

1. Diafon
2. Diathonite for Screed
3. Aquabit / first coat of Acriflex Winter or Acriflex Fybro (for surfaces smaller than 20 m²)
4. Polites (combined with Acriflex Winter)
5. Safety Joint Roll (in combination with Acriflex Winter and Acriflex Fybro) on joints between the wall and the floor / Safety Joint Top in all the other cases
6. Second coat of Acriflex Winter or Acriflex Fybro
7. Floorgum Paint / Colorflex / tiles

**Diafon features**

- Easy to apply, it must be spreaded with the insulating film upwards.
- With its insulating film it creates also a steam barrier.

**How to apply DiaFon**

1. Diafon is applied onto the base with the impermeable film upwards.
2. The surface must be completely covered. Pay attention to make border overlapping of about 40/50 mm, thus to realize a continuous soundproofing layer.
3. Diafon mat should be extended up over the walls in order to avoid rigid butting between flooring and other parts of the structure.
4. The extended or turned up part of the product should be higher than the final flooring, with the flap laid at 90°, thus avoiding rounded edges and preventing the formation of empty spaces between the mat and the tiling.
5. Diafon must be cut upon application of the tiling, the skirting boards must be laid afterwards, taking care not to attach it on the joint with the floor.
Insights

With Italian Legislative Decree 192/05 integrated and coordinated with LgsD 311/07 and Presidential Decree 59/09 and with national guidelines of Ministerial decree 26/06/2009, it is now compulsory to have an energy certification for every building of new construction, for the refurbishment and from July 1st 2007 also for all existing buildings that will be sold.

Energy certification:
- It is an important part of sales contracts
- It is valid for 10 years
- It must be renewed after 10 years: it is therefore important to insulate with materials that has excellent long thermal stability
- Work verification must be done within 5 years from project completion
- The consequence of non-compliance can be: police record, blacklisting on civil records, devaluation of commercial property value.

Examples of walls realized with Diathonite system reaching the standards set by Italian law
Here are some general examples of walls made with thermal block + thermal plaster Diathonite Evolution, which meet the parameters established for climate zones B, D and E.
Diasen Technical Dept. is available for the realization of customised thermal calculations depending on the different stratigraphy and climatic zones.

<table>
<thead>
<tr>
<th>Climatic zone</th>
<th>From January 1st 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0,62</td>
</tr>
<tr>
<td>B</td>
<td>0,48</td>
</tr>
<tr>
<td>C</td>
<td>0,40</td>
</tr>
<tr>
<td>D</td>
<td>0,36</td>
</tr>
<tr>
<td>E</td>
<td>0,34</td>
</tr>
<tr>
<td>F</td>
<td>0,33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Legend</th>
<th>Zone</th>
<th>Daily degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>up to 600</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>from 600 to 900</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>from 900 to 1400</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>from 1400 to 2100</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>from 2100 to 3000</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>over 3000</td>
<td></td>
</tr>
</tbody>
</table>

BOLZANO - Climatic zone E - Thermal transmittance $U = 0,34 \text{ W/m}^2\text{K}$

<table>
<thead>
<tr>
<th>Material type</th>
<th>Volumic mass</th>
<th>Resistance</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal brick</td>
<td>800 kg/m³</td>
<td>1,9231 m² K/W</td>
<td>0,300 m</td>
</tr>
<tr>
<td>Thermal plaster Diathonite Evolution</td>
<td>360 kg/m³</td>
<td>0,8889 m² K/W</td>
<td>0,040 m</td>
</tr>
</tbody>
</table>

$U_{tot} = 0,330 \text{ W/m}^2\text{K}$

ANCONA - Climatic zone D - Thermal transmittance $U = 0,36 \text{ W/m}^2\text{K}$

<table>
<thead>
<tr>
<th>Material type</th>
<th>Volumic mass</th>
<th>Resistance</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal brick</td>
<td>800 kg/m³</td>
<td>1,9231 m² K/W</td>
<td>0,300 m</td>
</tr>
<tr>
<td>Thermal plaster Diathonite Evolution</td>
<td>360 kg/m³</td>
<td>0,6667 m² K/W</td>
<td>0,030 m</td>
</tr>
</tbody>
</table>

$U_{tot} = 0,360 \text{ W/m}^2\text{K}$

PALERMO - Climatic zone B - Thermal transmittance $U = 0,480 \text{ W/m}^2\text{K}$

<table>
<thead>
<tr>
<th>Material type</th>
<th>Volumic mass</th>
<th>Resistance</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal brick</td>
<td>800 kg/m³</td>
<td>1,9231 m² K/W</td>
<td>0,300 m</td>
</tr>
<tr>
<td>Thermal plaster Diathonite Evolution</td>
<td>360 kg/m³</td>
<td>0,3334 m² K/W</td>
<td>0,015 m</td>
</tr>
</tbody>
</table>

$U_{tot} = 0,412 \text{ W/m}^2\text{K}$
Diathonite application

Preparation of support

- The support must be completely hardened, dry and resistant.
- The surface must be thoroughly clean, well consolidated, without debris or detaching parts. Eventually accurately clean with sandblasting and subsequent high-pressure washing.
- If applied on smooth surfaces, onto pre-existing plaster or reinforced concrete pillars, it is necessary to apply first an adhesion primer, such as Aquabond.
- If applied over painted support, completely remove the paint until reaching the rough plaster and successively apply an adhesion primer, such as Aquabond.
- For the application of Diathonite Deumix, completely remove the wall until reaching brick or stone, do not apply the product over old paint or smoothers. Remove from the wall interstitial salt deposit.
- The support temperature must be between +5°C and +30°C.
- Before the application of the product, it is advisable to cover doors and windows.

Application

1. Abundantly wet the surface. This operation is absolutely necessary during summer, not required during winter.
2. Prepare the area creating the reference bands to obtain the required thicknesses (points and reference bands must be created with the same product).
3. If applied by hand, it must be applied as a traditional plaster. Use the first coat as regularization with a thickness not higher than 1,0 cm. Once the first coat is dry, apply the second one up to the required thickness.
4. If applied by pump machine, spray the product with coats not higher than 2,0 cm and let dry. Successive layers must be applied when the below coat is dry. This system avoids the formation of micro cracks.
5. For thickness higher than 3 cm it is advisable to apply the product in more than 2 coats.
6. Beyond 6 cm of thickness it is advisable to use a plaster mesh (such as Polites 140).
7. Prop and smooth as for a normal civil plaster.

Mixing

Mix Diathonite Evolution for about 1-2 minutes with 10-15 l of water per bag of product (18 kg). It is strictly necessary to mix the material not longer than 3-4 minutes.
Diathonite Premix must be mixed for 4 minutes with 10-12 l of water per bag of product (20 kg).
Diathonite Deumix must be mixed for 4 minutes with 12-14 l of water per bag of product.
The water indicated on the package is indicative.
It is possible to obtain a more or less fluid consistency depending on the application to do. Never add anti frost product, cement or aggregates.
Diathonite application

Drying time

At 20°C and with relative humidity level of 40%, the product dries 15 days.
- Drying time is influenced by humidity level and temperature and may significantly change.
- Protect the plaster while curing from ice, direct sun light and wind to avoid successive cracks.
- 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.
- To finish the plaster it is possible to apply externally Argacem HP smoother and the finishing paint Plasterpaint Coloured or Argacem Coloured; while inside it is possible to apply Argacem Neutral smoother and the finishing Limepaint.
- The application of smoothers or coatings can lower the sound absorbing capacity of Diathonite Premix, depending on the thickness and the covering capacity of the used coating.

Suggestions

- Temperature must be comprised between +5°C and +30°C.
- 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 inside, especially onto low-thickness walls, it is necessary that the external surface does not absorb water. If needed apply Diasen finishings (Plasterpaint Coloured, Argacem Coloured or Acrilid Protect Coating) or, on external walls, apply a siloxane, transparent, breathing and water-repellent product such as Diasen BKK.
- Apply protective metal covering on internal corners.
- If applied on reinforced concrete wall, it is suggested to apply the product also internally, to allow the perfect insulation of the wall.

Application as screed

1. Accurately clean the loft from dust, paint and plaster deposits; moreover it is necessary to fill cracks and protect plumbing and electric systems before applying the product.
2. Mix the product in a concrete mixer or in the pump pressure machine for 4-5 minutes adding 12-15 lt of water per bag of Diathonite for Screed used (25 kg). The amount of water indicated on the packaging is merely indicative. It is possible to obtain more or less fluid mixture depending on the application. Never add antifrost products, cement or aggregates.
3. Lay Diafon mats over the surface to cover with the synthetic film facing upwards.
4. Remove the adhesive and seal the mats overlapping them of 40/50 mm to realize a continuous soundproofing layer. The surface must be completely covered.
5. Diafon mat must be skirted over the wall to avoid the formation of acoustic bridges between the floor and the structure of the building. The height of the skirting must be higher than the finished floor, the skirting angle must 90°.
6. Prepare the area creating reference bands to obtain the required thicknesses (points and reference bands must be created with Diathonite for Screed with an inter-axial distance not higher than 2 m). The screed must have a minimum thickness of 5 cm.
7. Apply the product following the traditional method for screed. Prop and smooth to obtain a perfectly even surface.
8. The maximum thickness that can be realized with one coat is 6 cm. For higher thicknesses lay the screed in two coats of equal thickness.
9. Diathonite for Screed can be applied using traditional pumps for screed.
10. Once the screed is completely cured, lay the desired floor (ceramic, marble or parquet flooring) using a suitable glue.
11. Cut Diafon over the paved surface.
12. Lay the skirting board without putting it into contact with the floor.
13. Wait until Diathonite for Screed is completely dry and cured before proceed with the next operations.
14. Do not squeeze the product during application.