

# DIATHONITE<sup>®</sup> DEUMIX<sup>+</sup>

ECO-FRIENDLY  
DEHUMIDIFICATION  
ANTI-EFFLORESCENCE PLASTER



**DIASEN**<sup>®</sup>  
GREEN BUILDING FUTURE



# **CORK, NATURE'S MAGICAL DEFENCE AGAINST HUMIDITY**

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# THE VIRTUES OF SUBERIN

**The essence of cork is expressed in the honeycomb-like structure of its cells whose cavities and walls are tightly grouped together, forming a cushion-like structure sealed by suberin, a waxy and hydrophobic layer which constitutes almost half the substance.**

Suberin contains long-chain fatty acids which, together with other ceroids present in the molecule walls, delivers waterproofing properties similar to those of fats and waxes, which protect against water and humidity.

THIS MOISTURE RESISTANCE ALLOWS CORK TO AGE SLOWLY WITHOUT SUFFERING STRUCTURAL DETERIORATION.



**The Diathonite Deumix<sup>+</sup> formulation leverages the moisture resistance of cork, combining it with the excellent dehumidification properties of hydraulic lime**, a material that absorbs moisture and releases it quickly. It does this thanks to high vapour permeability, which prevents the formation of superficial and interstitial condensation, and a pH similar to that of masonry (i.e. of bricks), which prevents the development of electrochemical reactions that can attract dampness.

# THE RAW MATERIALS

The Diathonite Deumix+ formula is the result of an innovative challenge: to develop a plaster that satisfies a range of different requirements.

The raw materials used, combined with natural fibres and additives, characterise Diathonite Deumix+ as a dehumidifying, anti-efflorescence, thermal insulating plaster.

This highly original formula was achieved without altering the natural characteristics of the raw materials, thus guaranteeing environmental compatibility and compliance with sustainability requirements.



## NHL5 HYDRAULIC LIME: THE AGE-OLD WISDOM OF MEDITERRANEAN BUILDING

It **absorbs and releases moisture**, contributing to the hygrometric regulation and dehumidification which greatly improve living comfort. The traditional characteristics of hydraulic lime make it **biocompatible and suitable for the restoration of historic buildings** which benefit from its mechanical strength, antibacterial properties, breathability and fire resistance.



## HYDRATED LIME: THE NATURAL DISINFECTANT

Applied to walls, hydrated lime acts as a **natural disinfectant** because, as it absorbs surface water on walls, it blocks the source of nutrients for spores, bacteria and mould, preventing their proliferation. As well as excellent breathability and porosity, which allow the material to act as a **hygrometric lung**, hydrated lime also delivers in terms of **elasticity and plasticity**; factors that facilitate adhesion and adaptability to masonry, preventing the **formation of cracks**.



## CLAY: HUMIDITY REGULATOR

It is a **light, porous, natural aggregate** which helps maintain a constant moisture level, making the microclimate of living spaces more pleasant and healthy. Indeed, clay **absorbs and disperses moisture** quickly and as required, maintaining the relative ambient humidity at ideal levels for living comfort. Suffice to say that clay can absorb up to 10 times more water compared to other similar materials.



## PERLITE: ULTRA-LIGHT DURABILITY

It is a **porous volcanic rock** which is ground into granules before undergoing rapid heating which causes the water to evaporate, expanding the granules. The resulting vitreous microspheres have very important properties: lightness, stability, chemical inertia, resistance to parasites and fire, in addition to **excellent breathability due to the closed cell structure** which increases its insulating capacity.



## NATURAL FIBRES: A WEALTH OF RENEWABLE RESOURCES

The characteristic that makes natural fibres the optimal choice is **their ability to disperse through the matrix**, forming a homogeneous material with excellent **resistance to shrinkage and micro-cracking**. This ensures long-lasting stability, the possibility of recycling, elasticity and a total absence of toxic residues.



## DIATOMACEOUS EARTH: TREASURE FROM THE OCEANS

It is the result of the accumulation of fossil material of marine origin. Diatomaceous Earth has a **high degree of porosity** that allows it to absorb liquids up to one and a half times its weight, remaining completely dry and maintaining its nature as an inert material. It is therefore **light, absorbent, hygroscopic and environmentally friendly**.

## FOCUS ON DAMPNESS

Water is a fundamental element in construction activities but it also plays a role in the ageing process of buildings.

INDEED, WE PROTECT OURSELVES FROM WATER BY ENSURING WE HAVE A ROOF OVER OUR HEADS, BUT WE MUST ALSO BE MINDFUL OF UNDERGROUND SOURCES, WHICH MAY RESULT IN DAMP WALLS AT GROUND OR BASEMENT LEVEL, **CREATING UNHEALTHY ENVIRONMENTS AND NEGATIVELY IMPACTING THE LIVEABILITY OF SPACES.**



**The walls of buildings generally rest on foundations that provide a firm footing, but sometimes there are no foundations and walls are built directly on earth.**

In these cases, and especially in buildings with masonry foundations, **the materials act like a sponge and the humidity** naturally present in the soil rises by as much as one or two metres with respect to ground level.

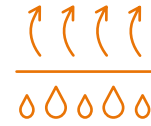
The problem is that plaster often **becomes detached as a result of pressure from the dampness inside the wall, in addition to natural deterioration processes** to which it is subject.

Moreover, when the water evaporates, efflorescence, namely crystallised mineral salts, remains visible on the surface, leading to corrosion and unwanted blemishes.

# CAUSES AND TYPES OF DAMPNESS

Dampness in masonry can be the effect of various different causes, which can be grouped into three main types: **rising damp, precipitation and condensation.**

The most common type is **rising damp** whereby humidity naturally present in the ground is absorbed and drawn up through the walls by capillary action.



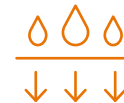
## 1. Rising damp

The humidity naturally present in the ground rises up through the masonry by capillary action. This is the most insidious type of damp because it carries with it dissolved mineral salts which trigger salt infiltration in masonry.



## 2. Dampness from precipitation

If not adequately protected with water-repellent finishes, external facades can absorb rainwater which, once inside the masonry, contributes to the deterioration of the building fabric, heat loss and the appearance of stains and mould.



## 3. Damp from condensation

Water vapour naturally present in indoor environments can travel through the building fabric and, if the walls are not adequately insulated, it can turn into interstitial condensation or superficial condensation.

# IMPACT AND CRITICALITIES OF DAMP WALLS

**The presence of humidity in walls is not merely an “aesthetic issue”, but can lead to serious problems which, if not fully resolved, can over time jeopardise the structural integrity of the building.**



## **Static damage**

- As moisture inside walls freezes in winter months, it can cause spalling.
- The crystallisation of salts within the pores of the building materials causes crumbling and decay.
- Over time, the decay of materials can jeopardise the static integrity of the structure.

## **Economic damage**

- Thermal insulation is compromised when masonry is damp, leading to increased heat dispersion.
- An increase in interstitial condensation due to cold walls.
- Increased winter heating costs for buildings.

## **Aesthetic damage**

- Detachment of plaster, erosion of connecting mortar and blistering of paint and finishes.
- Decay and deterioration of surface layers due to the crystallisation of salts.
- Formation of saltpetre, mould and efflorescence.

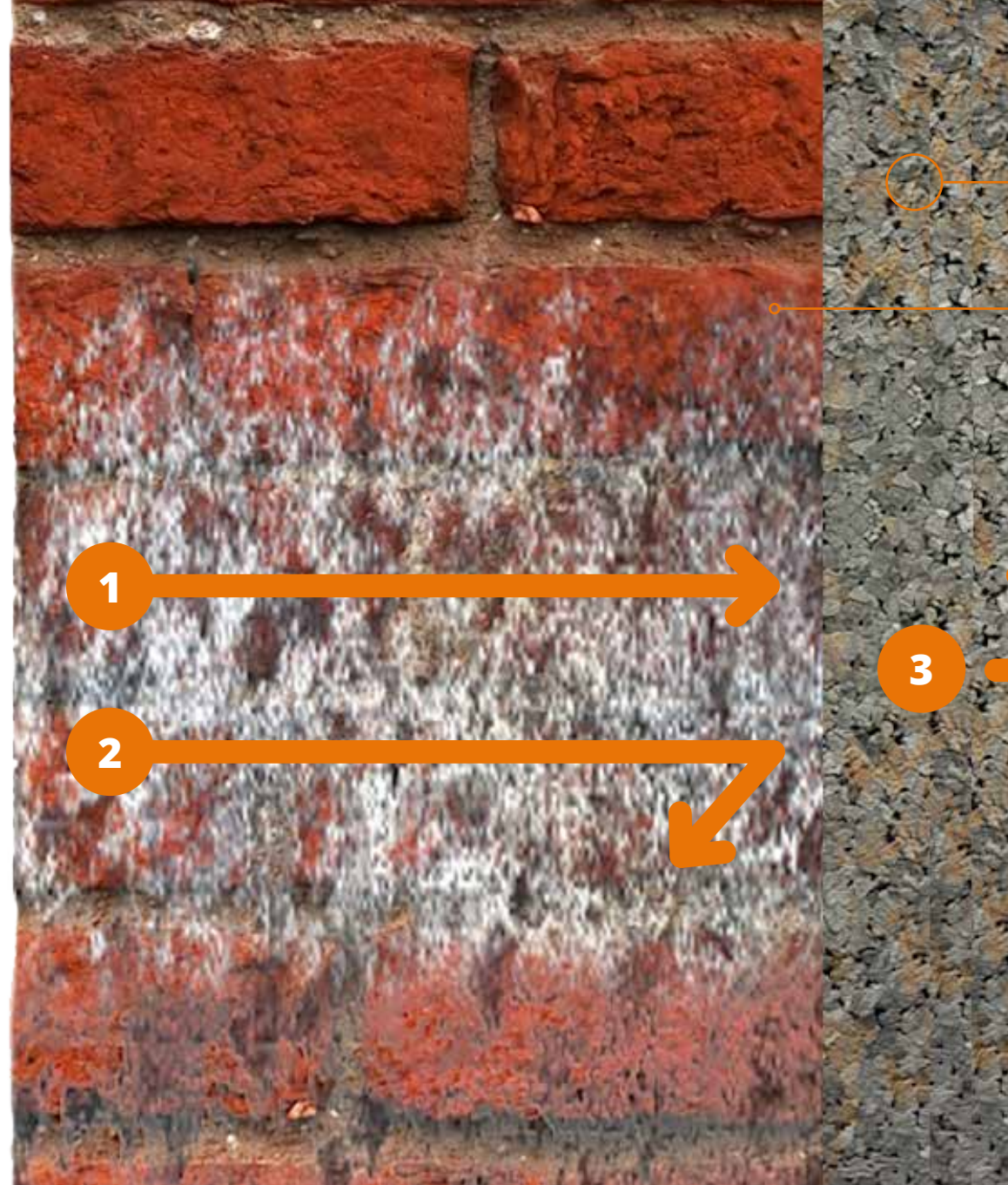
## **Serious health implications**

- Formation of mould which creates unhealthy ambient conditions.
- Increased allergic reactions and respiratory conditions.
- The high level of humidity and cold walls increase the feeling of overall ambient discomfort.

# HOW THE DEHUMIDIFICATION SYSTEM WORKS

**DIATHONITE DEUMIX+ COMBINES THE PROPERTIES OF A DEHUMIDIFICATION PLASTER AND OF A SALT RESISTANT MORTAR.**

It is formulated to **tackle problems that stem from humidity in masonry, protecting the walls from the decaying action of salts.**



**DIATHONITE DEUMIX+**

**DAMP MASONRY**

- 1. Drying of masonry**  
When the humidity present in the walls comes into contact with the dehumidification system, **it is absorbed and expelled outwards**, allowing walls to dry out completely. Even in the event of recurring dampness, the system's dehumidifying action remains unchanged thanks to the unique porous structure of the material.
- 2. Protection from salts**  
The active ingredient in **Diathonite Deumix+** allows the product to **block the passage of salts dissolved in the water, allowing only moisture to penetrate**. As a result of osmosis, salts are reabsorbed by the masonry, preventing the pores of the plaster becoming saturated
- 3. Moisture evaporation** Purified of salts, the moisture comes into contact with the porous structure of **Diathonite Deumix+**, where it spreads by capillarity throughout the honeycomb-like structure of the material. Thanks to the breathability and hygroscopicity of the plaster, the moisture can reach the surface, where it can **evaporate**.



# DATA AND PERFORMANCE



## DEHUMIDIFICATION PERFORMANCE



### BREATHABILITY

Walls that are free to breathe for masonry that is always dry.



### POROSITY

The pore structure of the plaster allows it to absorb and disperse moisture and condensation.



### CAPILLARY ABSORPTION

**Category W0**  
Rapid moisture dispersal.

## THERMAL INSULATION PERFORMANCE



### THERMAL RESISTANCE

A high level of thermal comfort guarantees walls that are always dry.



### THERMAL INSULATION

Limits the formation of interstitial condensation and contributes to energy savings.

## STRUCTURAL PERFORMANCE



### COMPRESSIVE STRENGTH

Excellent strength, durability and stability over time.



### REACTION TO FIRE

It does not burn or produce smoke

# CERTIFICATIONS

The certifications obtained by Diathonite Deumix+ testify to the company's commitment to environmental sustainability.

**DIATHONITE DEUMIX+** IS AN EXCEPTIONALLY VERSATILE PRODUCT AND THE **FRUIT OF AN ORIGINAL MIX OF COMPETITIVENESS, INNOVATION AND PERFORMANCE.**



## SUSTAINABILITY CERTIFICATIONS



Diathonite Deumix+ complies with the procedures, properties and values of EPD certification, which identifies products with a low environmental impact, facilitating a responsible choice. Stringent testing, inspection and control procedures enable measurement and verification of product sustainability at every stage of the product's life cycle.



Diathonite Deumix+ is formulated with materials which pose no harm to the environment and are safe for human use, both during application and once fully cured. For this reason, use of this product contributes to LEED credits in Green Building Council certification and compliance with the requirements established by Minimum Environmental Criteria (MEC)

## PERFORMANCE CERTIFICATIONS



The properties and specifications of the product comply with European regulations and meet all European building standards. The CE mark testifies to the safety, quality and uniqueness of Diathonite Deumix+ which are key elements for ensuring customer satisfaction.



The product has a low emission of volatile organic compounds, and it is designed to protect the **indoor well-being** of people and the **quality of the external environment.**

# CHARACTERISTICS AND ADVANTAGES OF COMFORT



## **EFFECTIVE WITH ALL TYPES OF DAMP**

Diathonite Deumix+ is effective not only in the treatment of rising damp: its thermal properties prevent the formation of interstitial condensation and limit the overall moisture to be managed.

## **LONG-LASTING DEHUMIDIFICATION**

Diathonite Deumix+ delivers long-lasting dehumidification of any masonry affected by rising damp for the upgrade of facades and walls.

## **HEALTHY ENVIRONMENTS**


Diathonite Deumix+ creates healthier environments: it improves indoor air quality, eliminates odours caused by damp walls and prevents mould thanks to its bacteriostatic and insulating properties.

## **INDOOR WELLBEING**

Diathonite Deumix+ guarantees maximum living comfort: warmer, dry interiors with controlled ambient humidity thanks to the product's hygroscopic properties and the elimination of interstitial condensation.

## **A NATURAL, ECO-FRIENDLY SOLUTION**

Diathonite Deumix+ contains natural materials such as cork, clay and NHL 5 natural hydraulic lime. It grants LEED credits, low VOCs, and respects the Minimum Environmental Criteria (MEC).



# CHARACTERISTICS AND ADVANTAGES: STRUCTURAL PERFORMANCE



## **THERMAL INSULATION AND ENERGY SAVINGS**

The excellent thermal properties of Diathonite Deumix+ increase energy savings: the product insulates against both heat and cold, upgrading external masonry in terms of both aesthetic appearance and functional performance.

## **DURABILITY AND STABILITY**

Diathonite Deumix+ is durable and elastic: it does not crack or spall, can be used both indoors and outdoors, does not require reinforcing mesh, is non-combustible and does not burn or produce smoke.

## **LIGHTWEIGHT SOLUTION**

Diathonite Deumix+ is three times lighter compared to traditional dehumidifying treatments. Even when thickly applied, it does not overload existing structures.

## **CE SAFETY CERTIFICATION**

Diathonite Deumix+ obtained CE marking in accordance with EN 998-1 regulations.

## **COMPATIBLE WITH HISTORICAL RESTORATION WORK AND GREEN BUILDING**

Diathonite Deumix+ is made with NHL 5 natural hydraulic lime which is compatible with historical restoration work on listed buildings. In the same way, it can be used in green building projects for both construction and renovation work.

# THE DEHUMIDIFICATION SYSTEM

**THE DEHUMIDIFICATION SYSTEM IS BASED ON PRODUCTS FORMULATED TO DELIVER A LONG-LASTING, STRUCTURAL SOLUTION TO PROBLEMS DERIVING FROM DAMPNESS WITHIN WALLS.** THE SYSTEM CATERS TO VARIOUS LEVELS AND TYPES OF DAMP AND DIFFERENT KINDS OF INTERVENTION.

The first step in the dehumidification system regards the evaluation of the initial condition of the support, which can be grouped into one of three main categories:

- **Underground and basement walls.** The product applied in this case is WATstop, a counter-thrust consolidating treatment for masonry damaged by the decaying action of damp.
- **Presence or absence of saltpetre.** Diathonite Deumix+ is applied directly to the surface because thanks to the dual action of a special additive, it creates a barrier that blocks the formation of salt efflorescence, encapsulating it by osmosis and preventing salt crystals from depositing in the pores of the plaster.
- **Uneven historical masonry with significant spalling.** Diathonite Regularization or Calce Storica are applied to level out any unevenness given by the nature of the substrate and to strengthen it.

Retaining walls  
**WATstop**



Presence/absence  
of salt efflorescence  
direct application of  
**Diathonite Deumix+**



**DIATHONITE  
DEUMIX+**  
AND  
**ARGATHERM  
SMOOTHER**

The central phase of the dehumidification cycle consists in the application of **Diathonite Deumix+** and **Argatherm**, a lime-based skim coat, with limestone aggregates and natural micro-fibres. Used in conjunction with the plasters of the Diathonite range, it guarantees a breathable system with excellent thermal insulation properties. The cycle is completed with the application of **breathable finishes** for:

- **Exterior walls and surfaces.** The ideal products are PlasterPaint, Argacem Coloured and Acrilid Protect Coating. These products ensure an excellent aesthetic finish and prevent the absorption of rain.
- **Interior walls.** The ideal products in this case are: LimePaint, which is highly breathable and regulates the hygrometric balance of indoor spaces; C.W.C Stop Condense, which prevents moist air from condensing on the walls, even with high levels of relative humidity.



Finishes for  
Interior walls:  
**C.W.C. Stop  
Condense;  
Limepaint.**



Finishes for facades /  
exterior surfaces:  
**PlasterPaint;  
Argacem Coloured;  
Acrilid Protect Coating.**

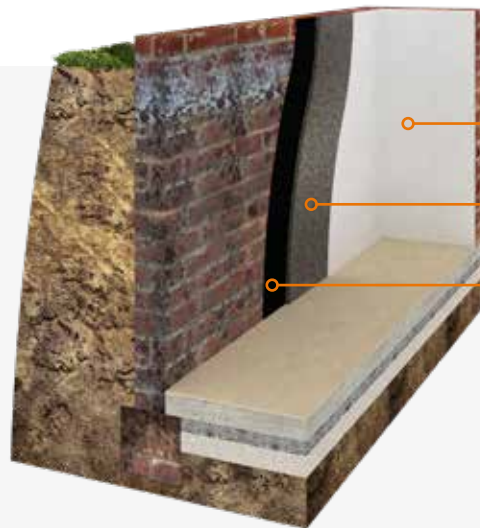
# DEHUMIDIFICATION

## RETAINING WALLS

In this case, before dehumidification with **Diathonite Deumix<sup>+</sup>**, the condition of the masonry must be evaluated.

If the walls present significant unevenness and imperfections, these can be filled and leveled

with **Diathonite Regularization**, followed by the application of **WATstop**, an epoxy resin used as an osmotic treatment for retaining walls, to encapsulate rising damp and create a vapour barrier on damp supports.



ARGATHERM

DIATHONITE DEUMIX<sup>+</sup>

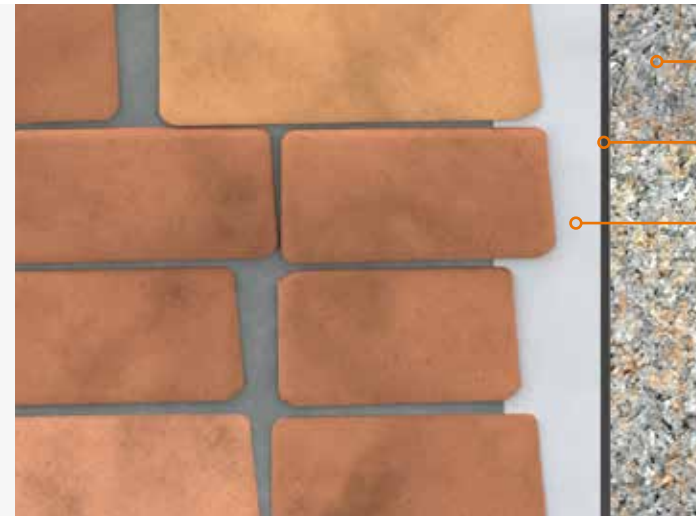
WATSTOP

## UNEVEN MASONRY

Dehumidification work on historical buildings often has to deal with uneven masonry.

**Diathonite Regularization** and **Calce Storica** are natural hydraulic lime-based mortars that help to reinforce and level out old masonry characterised by significant unevenness given by the nature of the stones and other materials from which it is formed.

USUALLY **HISTORICAL WALLS ARE CHARACTERIZED BY UNIQUE IRREGULARITIES**, THAT REQUIRE THE **USE OF PRODUCTS SPECIFICALLY FORMULATED TO ALLOW FOR GREAT THICKNESS OF APPLICATION, IDEAL FOR FILLING AND SMOOTHING EXTREMELY UNEVEN SUPPORTS.**



DIATHONITE DEUMIX<sup>+</sup>

WATSTOP

DIATHONITE REGULARIZATION

# THREE TIMES LIGHTER, THREE TIMES SMARTER

**Diathonite Deumix+ is a lightweight macroporous plaster formulated with top quality cork of selected and controlled grain size.**

For this reason, it has a density – and thus coverage – three times lower than that of traditional plasters; thanks to these characteristics, it stands out as a quick, precise, results-oriented solution. In other words, it is three times smarter!

THE SMARTNESS OF SOLUTIONS DERIVES FROM THE SMARTNESS OF THE MATERIALS, NAMELY FROM THE ABILITY TO CONCEIVE AND PRODUCE FORMULATIONS, LIKE **DIATHONITE DEUMIX+**, BASED ON A SPECIFIC REQUIREMENT: **TO ADAPT TO THE DYNAMIC NATURE OF DEMANDS, LEARNING FROM EVERY EXPERIENCE.**



## **Lower cost of transport and lower emissions**

One bag of Diathonite Deumix+ allows dehumidification of 2.5 m<sup>2</sup> of wall, with lower associated transport costs compared to a traditional product for dehumidification. Lower shipping costs means lower CO<sub>2</sub> emissions from transportation.



## **Less warehouse space**

Diathonite Deumix+ takes up three times less space in the warehouse, optimising handling, lifting and storage. Moreover, it is a straightforward solution: just one product for all types of walls and coverage that is easy to calculate.



## **Less waste on site**

Dehumidification with Diathonite Deumix+ requires three times less material and simplifies all activities on site: handling, lifting and storage. Moreover, thanks to the recyclable bag, it helps lower the waste production on site.

# SUCCESSFUL PROJECTS

## Convento de Jesus

*Setúbal, Portugal*

The monastery is an example of the famous “Manueline” style of architecture, a Portuguese version of late Gothic.

After falling into serious disrepair, the building underwent complex structural and architectural renovation. **Diathonite Deumix+** was used with considerable thicknesses, without overloading the structure, to restore the interior and exterior walls of the complex, which were badly affected by rising damp.



## Relais Borgo Torale

*Passignano, Italy*

The historical residence “**Relais Borgo Torale**” is a splendid resort located in Passignano sul Trasimeno, a picturesque hamlet overlooking Lake Trasimeno.

Dating back to the mid-seventeenth century, the ancient village originally belonged to the Marquis Ranieri of Sorbello and it is today a charming tourist resort. **Diathonite Deumix+** was applied to the exterior facades and all the interior walls of the structure.





# SUCCESSFUL PROJECTS

## Faculty of Medicine

*Belgrade, Serbia*

The historical headquarters of **Belgrade University's Faculty of Medicine** was upgraded using **Diathonite Deumix+** plaster. The product was applied to the facades, partly adjoining the Serbian capital's hospital, and to plinth courses, badly affected by very unsightly and serious damp problems which called for a dehumidification treatment with anti-efflorescence protection.



## Private building

*Città Sant'Angelo, Italy*

**Diathonite Deumix+** was chosen for the renovation of a private building in **Città Sant'Angelo**, a town in the province of Pescara in Italy's Abruzzo region.

The upgrade of the building, which had been badly damaged by an earthquake, entailed extensive renovation of the masonry and damp treatment. There are plans to turn the building into a resort.



# DIATHONITE<sup>®</sup> DEUMIX<sup>+</sup>

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DEHUMIDIFICATION  
ANTI-EFFLORESCENCE  
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