DIATHONITE® THERMACTIVE.037

MEDITERRANEAN THERMAL MORTAR FOR TOTAL LIVING COMFORT





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THE ENVIRONMENT IS LIFE, IT IS SHELTER... IT IS HOME

Nature is our primary supplier as, thanks to its generosity, we are able to combine and use the materials needed to produce Diathonite Thermactive.037.

The product is the result of the union of nature and technology which led to a formulation designed to improve domestic comfort.

Diathonite Thermactive.037 ensures thermal balance, healthy environments, harmony and durability:

preventing mould and condensation, reducing the discomfort of rapid temperature excursions, guaranteeing fire protection, mitigating the bitter cold of winter and the sweltering heat of summer, replicating Nature's own ingenious processes which represent the essence of "Mediterranean building".



THE FINEST BARK FOR THERMAL COMFORT

DIATHONITE THERMACTIVE.037 IS POWERED BY CORK AND ITS PRICELESS MAGIC: NATURAL, RENEWABLE, VERSATILE AND SUSTAINABLE, CONSISTING OF 80% AIR WHICH MAKES IT EXTREMELY LIGHT AND BREATHABLE.



Cork is Diasen's distinguishing feature and the beating heart of the Diathonite line, which it endows with unique properties that ensure effective application and excellent results.

Cork is unaffected by humidity, **preventing the formation of condensation**; it slows the propagation of sound, **guaranteeing acoustic insulation**; it reduces heat exchange, keeping houses cooler in summer and warmer in winter.

Because it is, in essence, protective bark, it is resistant to fire, insects and moulds. In addition, it offers outstanding **durability and creates a healthy household environment**: thanks to its anti-static properties, it prevents the accumulation of dust responsible for increasingly widespread allergies.



THE MAGIC OF MATERIALS

The Diathonite Thermactive.037 formulation is the result of an intuitive leap: **to develop and produce an innovative thermal insulating plaster that is different by nature and in terms of its application method**, and that fully reflects the company's commitment to sustainability and low environmental impact.

On this basis, the raw materials that characterise the formula share a common thread: **natural origins that allow them to fully exploit the properties of air as the most effective thermal insulating material found in nature.**

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

Obtained by cooking natural marl, it hardens even in the presence of water. In this way, the product uses a single binder which absorbs and releases moisture, performing a regulating action that responds to modern ideas of living comfort. The "traditional" characteristics of lime make it biocompatible and suitable for the restoration of monumental buildings which benefit from its mechanical strength, antibacterial properties, breathability and fire resistance.



NATURAL FIBRES: A WEALTH OF RENEWABLE RESOURCES

Natural cellulose fibre, obtained from recycled newspapers treated with boron salts, provides resistance to fire and parasites. The quality 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 longlasting 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 the fossilized remains of marine creatures, deposited on the sea bed over many millions of years. The shrinking of the oceans uncovered vast deposits of this material which has invaluable usage possibilities. Diatomaceous earth **has a high level of porosity** which allows it to absorb up to 1.5 times its weight in liquids, remaining completely dry and maintaining its inert form. It is therefore lightweight, absorbent, porous and eco-friendly.



PUMICE: A HAPPY ANOMALY OF STRENGTH AND LIGHTNESS

Pumice is a volcanic rock and **is composed by almost 90% air**; this porosity makes it the only rock which floats and endows it with a uniquely gentle abrasiveness that is highly valued by cosmetics and skincare industry. Its combination of strength and lightness boosts the value and performance of Diathonite Thermactive.037, to which it **gives resistance to external stress and to moisture absorption**. Its porosity guarantees lightness and thermal insulation coupled with excellent resistance to fire propagation.



EXPANDED AMORPHOUS SILICON: NECESSARY DISORDER

It is an extremely abundant natural material. The second most abundant element on earth after oxygen, in its amorphous state silicon does not form an orderly crystalline lattice, but a continuous random network with no defined shape. For this reason, **it can be expanded by encapsulating air**, creating ultra-lightweight inert spheres with excellent resistance to fire propagation. The characteristics of amorphous silicon, coupled with its expansive nature, ensure **excellent insulating properties, long-lasting stability and environmental sustainability**.



PERLITE: ULTRA-LIGHT DURABILITY

Perlite is one of the positive outcomes of volcanic eruptions. It is a highly porous rock which traps water. When it is ground into granules and undergoes rapid heating, the water evaporates, causing the granules to expand. 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.

THE INSULATING ACTION OF AIR

The materials used in Diathonite Thermactive.037 create extremely porous conditions, offering a certain thermal insulation resulting from the decisive action of air.

Air has a very low heat transfer capacity, with a thermal conductivity value that makes it one of the best insulating substances known to man.



WHY THERM? WHY ACTIVE? WHY .037?

DIATHONITE THERMACTIVE.037 RESPONDS TO A HUMAN NEED: TO REDUCE THERMAL DISCOMFORT.

The product's strength lies in its natural materials which ensure long-lasting thermal balance: insulating against harsh winter temperatures and giving relief from summer heat. **The challenge of thermal insulation** is to fulfil the wise old saying of wool-workers: what protects from the cold can also protect from the heat. Diathonite Thermactive.037 is Active because it is a dynamic product which acts over time, adapting to the climate variations throughout the year and to the ever-changing humidity levels. It acts like a hygrometric lung: absorbing and releasing water vapour, it prevents the accumulation of humidity and the formation of condensation. A healthy indoor environment stems also from dynamic materials.

.037 is the product's thermal conductivity value, also known as lambda value. This specifies the level of thermal insulation guaranteed by a given material, or in practical terms, how well our home is protected against heat and cold. The lower the lambda value, the greater the product's insulating capacity. The lambda of 0.037 is one of the lowest among plasters: a natural choice synonymous with beauty, comfort and protection.



THERMAL COMFORT VALUES



INSULATING PROPERTIES AND REACTION TO FIRE



Thanks to the right mix of carefully selected raw materials, the product achieves extremely high performance in terms of thermal insulation.



 $\alpha = 0.14 \text{ mm}^2/\text{s}$

The low diffusivity value indicates a high level of insulation against heat and therefore greater comfort, as well as savings on air conditioning in summer.



REACTION **TO FIRE**

CLASS A1

Classified in class A1 according to European standard EN ISO 13501-1. No production of flaming and no emission of smoke.

THE VALUES OF A HEALTHY ENVIRONMENT



DEHUMIDIFYING PROPERTIES

$\uparrow \uparrow \uparrow \uparrow \\ \land \Diamond \Diamond \Diamond$

DEHUMIDIFICATION CAPACITY

1.00 Kg/m²h^{0.5}

Contributes to the hygrometric balance of environments, for maximum living comfort.

$\frac{(((()))}{(())}$

BREATHABILITY

μ=3

Walls are free to breathe.

Thanks to high permeability,

ambient humidity is perfectly

balanced, thus preventing

the formation of mould and

condensation.

POROSITY

71%

A macroporous structure with a high air content guarantees excellent performance in terms of insulation and absorption of excess moisture.

STRUCTURAL VALUES



MECHANICAL PROPERTIES





ρ = 250 ± 15% kg/m³

The aggregates contained in the matrix make the product extremely light, facilitating application.



742 N/mm²

More elastic than traditional plasters, it reduces the risk of crack and fissures.



MECHANICAL STRENGTH

2.8 N/mm²

High compressive strength which gives walls greater consistency and stability.

SUSTAINABILITY AND PERFORMANCE

The performance guaranteed by Diathonite Thermactive.037 is validated by the product certifications issued by certifying bodies renowned for their rigour, reliability and stringent evaluation parameters.

DIATHONITE THERMACTIVE.037 IS CERTIFIED IN RELATION TO ENVIRONMENTAL SUSTAINABILITY AND APPLICATION

AND PROCESS PROPERTIES, HIGHLIGHTING THE UNIQUENESS OF THIS PRODUCT WHICH IS THE FRUIT OF AN ORIGINAL MIX OF COMPETITIVENESS, INNOVATION AND PERFORMANCE.

SUSTAINABILITY CERTIFICATIONS





The product complies with the procedures, properties and values of EPD certification, which **identifies products with a low environmental impact, facilitating a responsible choice** and representing a key distinguishing feature. Stringent testing, inspection and control procedures enable measurement and verification of **product sustainability at every stage of the product's life cycle**. This is an American green building rating standard which recognises the ability of Diathonite Thermactive.037 to contribute to healthier environments, **better indoor air quality, energy savings** and higher property value.

PERFORMANCE CERTIFICATIONS

CE

The properties and specifications of the product comply with European regulations and meet all **European building standards**. The CE mark granted to Diathonite Thermactive testifies to the product's safety, **quality and uniqueness, 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.**

NEW REGULATORY HORIZONS

As part of its 2030 Agenda, the European Union set itself ambitious goals regarding the continent's economic development:

• Cut greenhouse gas emissions by at least 40% compared to 1990 levels

• Increase the share of renewable energy

• Deliver energy savings in line with European strategy

• Improve the security, competitiveness and sustainability of Europe

PARAMETER	PRESENT STATIONARY CALCULATION TS 11300	FUTURE DYNAMIC METHOD EN ISO 52016-1:2018
Insulation from cold	★ ★ ★	* * *
Insulation from heat	* * *	* * *
Hygrometry	* * *	* * *
Thermal resistance	* * *	* * *
Inertia	$\star \star \star$	$\star \star \star$
Solar absorption Coefficient	* * *	***
Hourly climate data	* * *	* * *

To that effect, several European directives are under review: the current semi-stationary calculation method is abandoned in favour of an hourly dynamic calculation approach. The new regulations are more effective for calculating energy savings in summer months.

DIATHONITE THERMACTIVE.037



UNINSULATED WALL



LOW, VARIABLE LEVEL OF HUMIDITY GIVEN THE BREATHABILITY OF THE SYSTEM HIGH LEVEL OF HUMIDITY: RISK OF CONDENSATION, NON-BREATHABLE MATERIAL

The wall sections illustrate two different **levels of interstitial condensation**. On the left, with **Diathonite Thermactive.037**, the level is lower than in the wall on the right.

Diathonite Thermactive.037 **blocks the accumulation of moisture** thanks to it its breathability, **expelling it to the outside**.

THERMAL COMFORT WITH LOWER CONSUMPTION

THE LIMITATIONS OF THE CURRENT MODEL IN ACCORDANCE WITH **TS 11300 WILL BE OVERCOME** BY REPLACEMENT WITH AN **HOURLY DYNAMIC CALCULATION** THANKS TO **EN ISO 52016** STANDARD "ENERGY PERFORMANCE OF BUILDINGS – ENERGY NEEDS FOR HEATING AND COOLING, INTERNAL TEMPERATURES AND SENSIBLE AND LATENT HEATING LOADS". In Mediterranean climates, buildings must be protected against heat ingress.

To this end, a summer planning strategy needs to include building envelope insulation, the study of solar shading devices, analysis of the building's inertial response and the use of natural ventilation.

The farther south we go, the more energy we consume in summer and the use of the dynamic calculation method highlights how some materials, in summertime, do not save energy but on the contrary increase energy consumption.



THERMAL PERFORMANCE AND TEMPERATURE

The thermal properties of Diathonite Thermactive.037 are confirmed by analysis of thermal diffusivity, which is thermal conductivity divided by density and specific heat capacity. This is a particularly valuable parameter for describing propagation of the thermal field in non-stationary regimes.



The experimental evaluation of this comparative behaviour was conducted in compliance with the parameters established in **EN ISO 10456:2008**: "Building materials and products - Hygrothermal properties" - Tabulated design values and procedures for determining declared and design thermal values. The graphic illustrates how in summer months, when the surface temperature of the exterior insulation even exceeds 60°, the thermal insulating properties of the synthetic materials plummet, allowing transmission of heat to the building interior, with marked deterioration of indoor climate conditions. In this context, the intrinsic characteristics of Diathonite Thermactive.037, meanwhile, provide the insulation from heat which synthetic materials are unable to offer.

NEW BUILDS: EXTERIOR THERMAL INSULATION

THE EXTERNAL ENVELOPE SYSTEM ENSURES HIGH THERMAL INSULATION VALUES AND IS MORE COST-EFFECTIVE THAN A REINFORCED CONCRETE STRUCTURE.

Unlike traditional dry systems, the versatility of **Diathonite Thermactive.037 thermal insulating plaster allows intervention on both the exterior and interior masonry**, increasing the wellbeing and value for money offered by the system.

SOLUTION FOR THERMAL BRIDGES

Diathonite Thermactive.037 applied over a thermal bridge:

• increases the insulating capacity at the heat dispersion point

• prevents the formation of mould and condensation

• creates a continuous insulating layer





THE STRONG POINTS OF THE DIATHONITE THERMACTIVE.037 SYSTEM FOR NEW BUILDS





RAPID AND EFFICIENT CONSTRUCTION SYSTEM

The three-step system offers easy layers with no discontinuity or thermal bridges, and it eliminates all difficulties associated with fixing phases: less work and more savings.

TRADITION AND THERMAL COMFORT

It prevents thermal dispersion in winter and overheating in summer, favouring energy savings and indoor wellbeing. It is ideal in Mediterranean environments as it stabilises temperature and climatic excursions.

DURATION

It guarantees perfect sealing of the walls and building against the elements: resistant to temperature excursions, it reduces thermal expansion of materials, increasing their durability and cutting maintenance costs.

STRENGTH

It gives the walls high mechanical strength for guaranteed soundness and stability. High elasticity and continuity in the application prevent the formation of spalls, cracks or fissures.

PREVENTS DAMP AMD MOULD

It is dehumidifying, breathable and permeable thanks to the porosity of the material which prevents pockets of humidity and the formation of condensation and mould on thermal bridges or exposed walls.

COMPLIANT WITH GREEN BUILDING STANDARDS

As a natural, eco-friendly and non-polluting product, it complies with green building principles at all stages of its life cycle: from production to disposal.

THE SYSTEMS: INTERIORS

DIATHONITE THERMACTIVE.037 IS IDEAL FOR INTERIOR

INSULATION. INTERIOR INSULATION IS OFTEN THE ONLY SOLUTION POSSIBLE, FOR EXAMPLE FOR STONE MASONRY, FINISHING BRICKS TO BE LEFT EXPOSED, OR HISTORICAL BUILDINGS WHOSE ORIGINAL APPEARANCE MUST BE PRESERVED. Formulated as a spray-on thermal insulating plaster, it can be applied even to vaulted ceilings and curved surfaces, important architectural features in the field of restoration.



THE STRONG POINTS OF THE DIATHONITE THERMACTIVE.037 SYSTEM FOR INTERIORS





NO MOULD OR CONDENSATION

Diathonite Thermactive.037 is extremely breathable and thermal, which is why it prevents mould and condensation, guaranteeing optimal living comfort and good indoor air quality.

HYGROMETRIC LUNG AND TREATMENT OF DAMP

The excellent breathability and ability to absorb and release water vapour prevent condensation, contributing to an ideal thermo-hygrometric balance. The product's dehumidifying capacity allows rapid moisture dispersal.

WARM WALLS

Unlike cement-based plasters, the Diathonite Thermactive.037 system produces walls that feel warm to the touch. Warm walls heighten the feeling of wellbeing which is part of the thermal comfort of a home.

COST-EFFECTIVE SYSTEM

The system avoids the need for cavity walls, thus saving space as well as reducing costs compared to classic dry insulation systems.

USABLE WALLS

High compressive strength, similar to that of traditional plaster, guarantees the usability of walls, allowing wall-mounting of pictures, TVs, shelves, etc.

ACOUSTIC WALLS

Thanks to its honeycomb-like structure, it offers better sound absorption coefficients than traditional plasters and absorbs sound waves effectively, improving the acoustic insulation of walls.

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THE STRONG POINTS OF THE DIATHONITE THERMACTIVE.037 SYSTEM FOR RENOVATIONS





LIGHTNESS AND STRENGTH

It is four times lighter than traditional plaster and guarantees excellent mechanical strength, preventing any problems of cracking.

FACADE PROTECTION

Seamless protection of the building envelope prevents the deterioration of the facade. Used in building upgrades, it prevents water infiltration and condensation.

TREATMENT OF DAMP AND HIGH HUMIDITY

The porous structure permits effective elimination of rising damp. The product's breathability and ability to absorb and release water vapour prevents surface dampness, mould and condensation.

GREEN BUILDING-COMPLIANT RENOVATION

Thanks to its formulation based on eco-friendly materials including lime and cork, Diathonite Thermactive.037 is ideal for use in the renovation of historical buildings and meets sustainability standards.

SMOOTHING (LEVELLING) OF WALLS

For smooth, even facades. Formulated as a sprayon insulation coat, it offers excellent adhesion to all surfaces, levelling out walls.

EFFICIENT SYSTEM - LOWER BUILDING COSTS

Ensures rapid, effective application on existing masonry, greatly reducing building and labour costs. When applied on old plaster, it removes the need for work on thresholds and windows.

THE SYSTEMS: MIXED MASONRY AND OLD PLASTERS

UPGRADE OF OLD PLASTERS

Diathonite Thermactive.037 can be applied as a **thermal insulation coat over existing plasters** in a good state of repair.

FACADE REFURBISHMENT COUPLED WITH THERMAL INSULATION INCREASES THE VALUE OF A BUILDING.

With its versatile use, lightness, excellent breathability, mechanical strength and restoring and insulating properties, Diathonite Thermactive.037 is ideal for the energy retrofitting of buildings, historical restorations and green building.





- 2. DIATHONITE THERMACTIVE.037
- **ARGATHERM** Thermal smoother skim coat

DIASEN COLOURED FINISHES Breathable and water repellent coatings



HIGH-PERFORMANCE INSULATION SYSTEMS

Thermal insulation must be designed and installed as an integral part of a system. Accordingly, it can only be considered optimal if the work on walls is carried out using highly insulating, breathable materials which prevent temperature excursions and condensation.

To maximise thermal insulation and energy savings, Diasen developed **Argatherm**, a **smoother skim coat** formulated with lime, limestone aggregates



and natural microfibres. Used in conjunction with the thermal insulating plasters of the Diathonite line and thermal paints, it **creates a breathable system with excellent insulation** for unparalleled thermal and living comfort in any interior.

The system for thermal insulation, energy savings and living comfort based on the combined use of Diathonite and Argatherm can be rounded off with **Decork Alfareflex finish**, a white cork-based paint formulated with water-based resins which offers an invaluable characteristic: the **ability to reflect approximately 80% of solar radiation**.

The product's technical characteristics thus provide buildings with a high level of thermal insulation, energy savings and thermal comfort, which is particularly important in summer months, as well as an elastic, water-repellent finish designed to withstand the elements, including the **erosive action of salt in coastal locations**.



THERMAL CONDUCTIVITY

$\lambda = 0.128 \text{ W/mK}$

The mix of raw materials traps air, ensuring lightness and strength.



PERMEABILITY

μ = 15

The ratio of aggregates to binders makes the product lightweight, leaving walls free to breathe.

MECHANICAL STRENGTH

≥15 N/mm

High mechanical strength delivers consistency, protection and durability.

ARGATHERM

Thermal insulation must be designed as an integral part of a system. **Argatherm** is a lime-based smoother which, used in conjunction with Diathonite Thermactive.037 and

thermal paints, creates a system with conductivity values that prevent thermal dispersion, favouring energy savings. In addition, it does not affect the breathability of the thermal

insulation coat, it prevents interstitial condensation and, thanks to the presence of lime, it also prevents the proliferation of mould.



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THERMAL CONDUCTIVITY

 λ = 0.086 W/mK

The mix of raw materials traps air, ensuring lightness and strength.



SRI (SOLAR REFLECTANCE INDEX)

80%

The high solar reflectance index favours energy savings and the thermal insulation of the building.



PERMEABILITY TO WATER

Category W2

The permeability value balances the humidity in the walls, preventing mould and condensation.

DECORK ALFAREFLEX

The Diasen insulation system is rounded off with **Decork Alfareflex**, a white cork-based paint which reflects 80% of solar radiation. The product ensures excellent energy savings because its conductivity and solar reflectance prevent overheating, contributing to hygrometric regulation and delivering an elastic finish designed to withstand the elements, including the erosive action of salt in coastal locations.

SUCCESSFUL PROJECTS

PRIVATE HOME Forlì, Italy

The work was carried out as part of the **improvement of this private villa** located in the countryside near Forlì.

For the refurbishment of the building, Diathonite Thermactive.037 was chosen for the interiors and well as the exterior, with the use of WATstop on the plinth course.



"Nucleo" Family home

Medolla, Italy

Nucleo represents a successful experience, the fruit of architecture that combines design with highperformance, high-value materials.

Diathonite Thermactive.037 met the project's exacting seismic safety and thermal insulation requirements, delivering a superbly comfortable home characterised by the use of eco-friendly, efficient materials and minimum emissions.



SUCCESSFUL PROJECTS

Hotel Exmo Porto, Portugal

Diathonite Thermactive.037 was used for the interior and exterior upgrade of a historical building which over the centuries has served various functions typically associated with a city of commerce and trade. The building has now been converted into a modern, trendy hotel.



Belgrade Waterfront *Belgrade, Serbia*

Belgrade Waterfront is a huge and suggestive complex of residential tower buildings, close to where the Danube river meets the Sava river. It marks a milestone in the history of the Serbian capital, as it is being built 20 years later from the last bombs on the city.

Diathonite Thermactive.037 has been used to improve the thermal insulation in each apartment of the 24-story buildings of the complex, ensuring low thicknesses insulation and allowing to gain more space in each flat.

Furthermore, the material ensures a perfect protection against fire, respecting the Serbian regulations.



DIATHONITE® THERMACTIVE.037

MEDITERRANEAN THERMAL MORTAR FOR TOTAL LIVING COMFORT





DIASEN Sassoferrato, Italy diasen@diasen.com **DIASEN FRANCE** Sablet, France france@diasen.com

Newnan, GA, 30263

DIASEN USA

usa@diasen.com

DIASEN IBÉRICA

singapore@diasen.com

DIASEN ASIA

Singapore

7005 - 177 Évora, Portugal iberica@diasen.com

DIASEN SERBIA

Belgrade, Serbia easterneurope@diasen.com

DIASEN MIDDLE EAST

Sharjah, F.Z.E. - U.A.E. me@diasen.com



www.diasen.com