

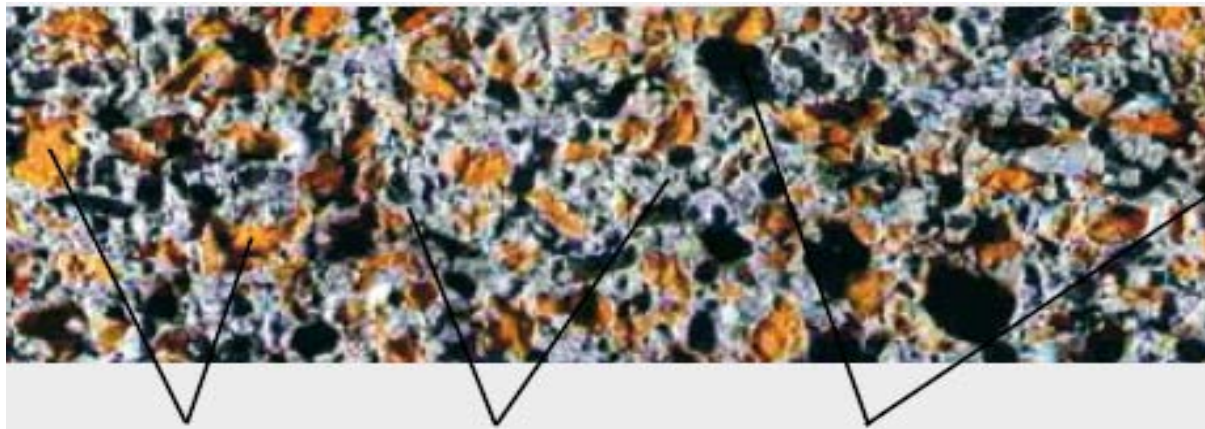
DIATHONITE

The cork based plaster

**Thermal, dehumidifying and
soundproofing**

DIATHONITE

- *Cork*
- *Clay*
- *Diatomite*
- *Natural Hydraulic Lime (NHL 3.5)*
- *Fybers*




Cork

Clay

Carvenous holes

THERMAL CONDUCTIVITY (λ lambda)

GLAB  **CERTO**
CENTRO DI RICERCA TOSCANO R.N°124/2006

Rapporto di determinazione della Conduttività Termica

Azienda Richiedente: **Diasen srl** z.i. Berbentina, 5 Sassoferrato (AN)

Parte inerente al campione

Data arrivo Campione: 09-02-2006
 Prodotto in Esame: **Intonaco isolante Diathonite Evolution**
 Descrizione provetta: provini appositamente costruiti
 Misure provette: N 5 da m 0.200 X 0.200 X 0.030
 Tipo di supporto: Nessuno. Prodotto preparato senza alcun supporto
 Umidità Relativa arrivo: 8.54 misurati con la massa costante secca (M. V. all'arrivo=**360 Kg/m³**)
 Produttore: **Diasen**
 N.Campione laboratorio: 09B16886

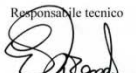
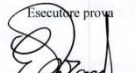
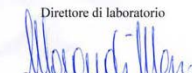
Norma di Riferimento: **UNI 7745 +12667**
 Autore: CTI - Comitato Termotecnico Italiano
 Titolo: Determinazione della Conduttività termica con il metodo della piastra calda con anello di guardia.

Parte inerente alla prova

Data della prova: Dal 13 al 21-02 **Data del rapporto 21-02-2006**
 Operatore: Enzo Morandi + Alessio Degli Innocenti
 Temperatura laboratorio: 21° Umidità: 60% (UR di prova del campione: **4,5%** poco cambiata)
 Strumento usato: Camera climatica con termoisolamenti supplementari
 Strumento usato: Apparecchio a piastra calda in Alluminio e trappola di calore
 Misura piastra scaldante: **mm 100 X 100 - W 26** potenza su area di prova di m² 0.01
 Posizione appar.e provino: Giacitura **orizzontale**, calore **discendente**
 Massa campione essiccato: **=292 Kg/m³ (impastato ed essiccato)**
 Condizionamento: oltre 168 ore in ambiente controllato 23/50 fino a massa costante

Prodotti e risultati							
Nome Campione	Volume	Massa V test	t ₁	t ₂	diff.ΔT	tempo°C	Conduttività Termica
Campione	V=0.0003m³	295 camb.1%	50°C	20°C	17.4	4 ore	$\lambda = 0.045$ w/mK

osservazioni NB:Il volume non è cambiato durante la prova. Durante la prova non è stato usato acqua liquida o sotto forma di vapore. I provini sono stati provati singolarmente, uno per ogni giorno. la differenza del risultato è stata inferiore dello 0.2%. La massa dopo la prova è aumentata dell'1%

Responsabile tecnico  Esecutore prova  Direttore di laboratorio 

Attenzione: Questo rapporto di Prova riguarda solo i campioni testati. Questo rapporto non può essere, ridotto o modificato per nessuna ragione.

$\lambda = 0,045$ W/mK

-Probably the most thermal plaster available on the market

-The product can claim excellent thermal skills thanks to the presence of cork



BREATHABILITY



Via G. Cesarelli 1 (Loc. Campo dell'Olmo), 60044 Fabriano (AN)
Tel. 0732-628311 / fax 0732-628930
web: www.meccano.it
email: led@meccano.it

Laboratorio prove autorizzato con D.M. n° 3696 del 21.07.08 ad effettuare prove sui materiali da costruzione ai sensi dell' art. 20, legge del 05.11.1971 n° 1086.

Pagina 6 di 7

Dai valori misurati (Cfr. Tab. 2 e Figg. 5-6) si possono elaborare i dati ai sensi delle relazioni (1) e (2) al fine di determinare il coefficiente di permeabilità al vapore μ (Tab. 3):

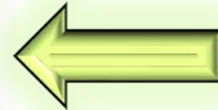
	CAMPIONE					VALORI MEDI
	1	2	3	4	5	
G (kg/s)	4.70E-08	4.12E-08	4.02E-08	3.76E-08	3.94E-08	4
W (kg/m ² Pa s)	2.24E-08	2.01E-08	1.91E-08	1.79E-08	1.88E-08	
μ	3.30	3.68	3.86	4.13	3.94	

Tabella 3. Valori di Permeabilità al Vapore

I valori presenti in tabella 3 sono stati preventivamente corretti, così come richiesto dalla norma al Rif. 2-a, per tenere conto di alcuni aspetti, descritti nella successiva appendice A e legati alla presenza del bordo schermato.

6. Conclusioni

Dalla sperimentazione fatta si dichiara che il valore del coefficiente di permeabilità al vapore d'acqua medio μ risulta pari a 4 e quindi inferiore rispetto al limite imposto dalla norma (Rif. 2-b) pari a 15.



$$\mu = 4$$

Thanks to the presence of several microcavities and hollows, the product lets the walls breathe and guarantees the right hygrometric balance of the building.

The most **breathable** thermal plaster available on the market

Diathonite is an excellent natural remedy against humidity problems, due to its **high breathability** and **water-absorption** features (0,35 Kg/m² in half an hour).



Il Direttore del Laboratorio
Ing. Marco Calbucci

ELASTICITY + MECHANICAL RESISTANCE

CERTO
CENTRO DI RICERCA TOSCANO R. N°108/2006

Rapporto di prova dinamo. modulo d'elasticità secante a compressione

Azienda Richiedente: **Diasen srl** z.i. Berbentina, 5 Sassoferrato (AN)

Parte inerente al campione

Data arrivo Campione: 09-02-2006
Prodotto in Esame: **Intonaco isolante Diathonite**
Descrizione provini: provini appositamente costruiti
Misure provini : mm 30 X 30 X 90
Produttore: Diasen
Stagionatura: I campioni sono stati preparati da Diasen ed arrivati a noi già induriti
N.Campione laboratorio 09B16886

Norma di Riferimento: UNI 6556 Adattato senza modifiche all'intonaco
Organo competente: UNICEMENTO Prove sui calcestruzzi
TITOLO: Determinazione del modulo elastico secante a compressione

Parte inerente alla prova

Data della prova: 17-02-2006 e 21-02-2006 (data del presente rapporto 21/02/06)
Operatore: Enzo Morandi
Temp. Laboratorio: 23°C / Umidità: 50%
Macchina usata: Dinamometro "ATSnar TC 1000" con cella da 5000 N
Attrezzatura Usata: Base piana inferiore + spintore cilindrico da Ø mm 50
Climatizzazione: Oltre 168 ore (una settimana) in ambiente controllato 23/50
Temperatura Pezzi: Circa 20°C
Velocità di spostamento: 30 mm. al minuto

Prove e risultati						
Nome camp.	Res. comp.	Res. comp. Prov.	T base. 01	T im. 02	T. unico	Mod. secante
Diathonite	N/mm² 2,0	N/mm² 1,85	N 200	N 504	N 103	742 N/mm²

Spiegazioni: ...
Responsabile prova: ...
Direttore del laboratorio: ...

Certo srl - Loc. Bellivista 26, Poggibonsi (SI) - Tel./Fax 0577.979573 - cell. 348.3706559

742 N/mm²: 3 times more elastic than a traditional plaster (important to avoid cracks)

1,85 N/mm²:
Mechanical
Resistance

FIRE RESISTANCE

LAPI
LAPI LABORATORIO PREVENZIONE INCENDI S.p.A.
Sede Primaria: I-57100 PRATO - Via della Quercia, 11
Telefono: +39 0574 579 320 - Telefax: +39 0574 579 323
Sede Secondaria: I-50011 CALZANO (PD) - Via Petronia, 08
e-mail: lapilab@lapilab.it
web site: www.lapilab.it

Warranty
LAPI

Notified Body N°0987
Directive 89/106 CEE

EN 13501-1
Testing and certification to EN 13501-1

ATTESTAZIONE DI CLASSIFICAZIONE ACL/554/11/CPD/- -
Classification Assessment

Quando applicabile il presente documento viene emesso in ottemperanza della direttiva 89/106/CEE del Consiglio del 21 dicembre 1988 e in attuazione alle leggi, regolamenti e provvedimenti amministrativi degli Stati Membri concernenti i prodotti da costruzione (CPD) aggiornata con la direttiva 93/46/CEE del Consiglio della Comunità Europea del 22 luglio 1993, si stabilisce che:
When applicable the following document has been issued in compliance with the Directive 89/106/EEC of the Council of European Communities of 21 December 1988 on the approximation of law, regulations and administrative provisions of the Member States relating to the construction products (Construction Products Directive - CPD), amended by the Directive 93/46/EEC of the Council of European Communities of 22 July 1993. It has been stated that the construction product:

RAPPORTO DI CLASSIFICAZIONE DI REAZIONE AL FUOCO N° 554.DCC0055/11
Reaction to fire classification report n°.

CLASSIFICAZIONE RICHIESTA DA / Classification on behalf of
DIASEN S.r.l.
Zona Industriale Berbentina, 5 - 60044 SASSOFERRATO (AN) - ITALY

DENOMINAZIONE COMMERCIALE DEL MATERIALE / Trade name of the material
DIATHONITE EVOLUTION

METODI DI PROVA / Test methods
EN ISO 1716: 2010 and EN 13823: 2010

STANDARD DI PRODOTTO / Product Standard
Non applicabile / Not applicable
(Prove non eseguite in accordo ad alcun standard di prodotto)
(Tests not carried out in accordance to any product standard)

METODO DI CLASSIFICAZIONE / Classification standard
EN 13501-1: 2009
Fire classification of construction products and building elements -
Part 1: Classification using test data from reaction to fire tests
(Classificazione al fuoco di prodotti ed elementi da costruzione -
Parte 1: Classificazione sulla base dei dati di prove di reazione al fuoco)

CLASSIFICAZIONE / Classification
A2 - s1, d0

La classificazione sopra riportata è valida per la seguente applicazione effettiva:
rivestimento parete e soffitto
Il Laboratorio non è stato coinvolto nell'attività di campionamento.
The above reported classification is valid for the following actual end use:
wall and ceiling lining
The Laboratory has not been involved in sampling activity.

Prato, 04/01/2012
Valid until: 03/01/2017

Il Responsabile Certificazione
The Certification Manager
Dr. Massimo Pignatelli

Il Direttore Tecnico
The Technical Director
Dott. Ezio Fusini

ACCREDIA
n° 2008
Le prove sono state eseguite in accordo all'accreditamento EN 17025
Tests have been carried out in accordance to accreditation EN 17025

Questo documento deve essere consultato insieme ai Rapporti di Prova, per la descrizione del prodotto e per ogni altra notizia di dettaglio.
Questo documento non costituisce approvazione di tipo né certificazione di prodotto né tantomeno dichiarazione di conformità, che spetta esclusivamente al Produttore / Sponsor.
This document has to be read in conjunction with the Test Reports, for the description of the product and for any other detail. This document does not represent type approval or certification of the product neither declaration of compliance, that is exclusively under the responsibility of the Manufacturer or Sponsor.

Il presente Rapporto di Prova non può essere riprodotto in forma parziale senza l'autorizzazione scritta di questo Laboratorio

A2 - S1 - d0: One of the safest level between the scale from A1 to F

LEGEND:

A2 = fireproof material
S1 = absence of toxic smoke during the combustion
d0 = no burning debris falling down

DIASEN
IMPROVE YOUR BUILDING

DIATHONITE: Application fields

- External thermal insulation

The high thermal conductivity makes this product suitable for exterior insulation both of new and old walls, protecting from heat and cold.

- Correction of thermal bridges

It is possible to apply a higher thickness of product in presence of thermal bridges, both inside and outside.

- Energetic requalification of old buildings

Due to its lightness, versatility of use, high flexibility, Diathonite can be applied directly on existing plasters and on mixed brickwork.

- Dehumidification

Thanks to the presence of diatomeic powders, Diathonite is the only one thermal and dehumidifying plaster.

DIATHONITE: Application fields

- **Acoustic insulation of partition walls**

Diathonite system offers a certified choice to the traditional acoustic insulation systems.

- **Elimination of acoustic reverberation**

Thanks to the presence of microcavities, Diathonite is the best sound-absorbing plaster on the market.

- **Impact noise insulation**

Diathonite is a lightweight material and it is certified to be used as a floating floor.

- **Thermal screed**

Thanks to its mechanical resistance and the possibility to stick the tiles directly on the product, Diathonite is an excellent low-thickness system.

DIATHONITE: Advantages

- **Keeping the exterior surface uniform and leveled**

Diathonite versatility allows to level every wall perfectly, in case of restoration but also in new constructions.

- **Easy insulation of thermal bridges**

Diathonite application assures continuity in the insulation material and the correct thickness for the insulation of thermal bridges.

- **Reduction of application mistakes**
Simple and quick construction system.



DIATHONITE: Advantages

- It avoids condensation and mould
- Lack of crackings
- Mechanical resistance
- Protection against cold and heat
- It reduces the costs of heating and air-conditioning systems.

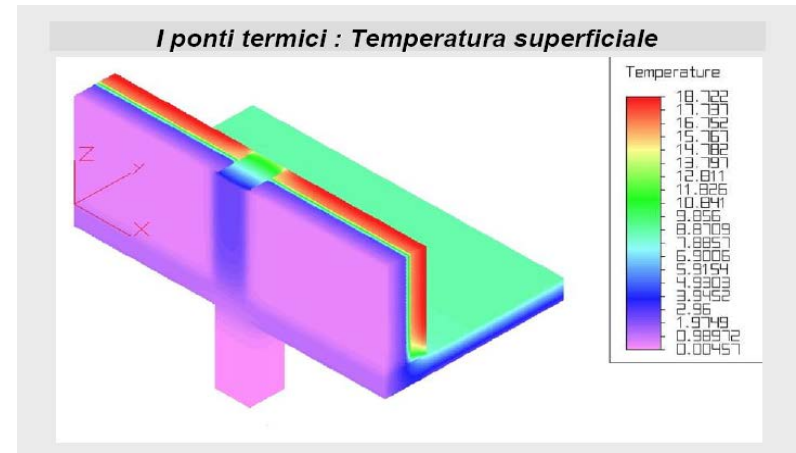
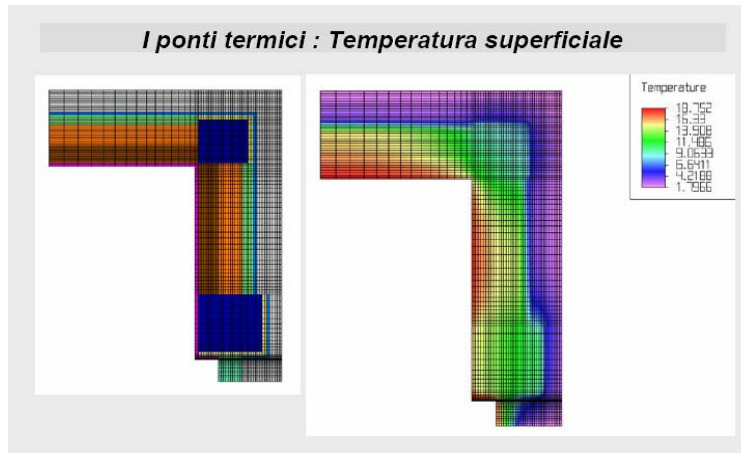


DIATHONITE: APPLICATION FLEXIBILITY

Application methods:

- External application
- Internal application
- Internal and external application

THERMAL BRIDGE



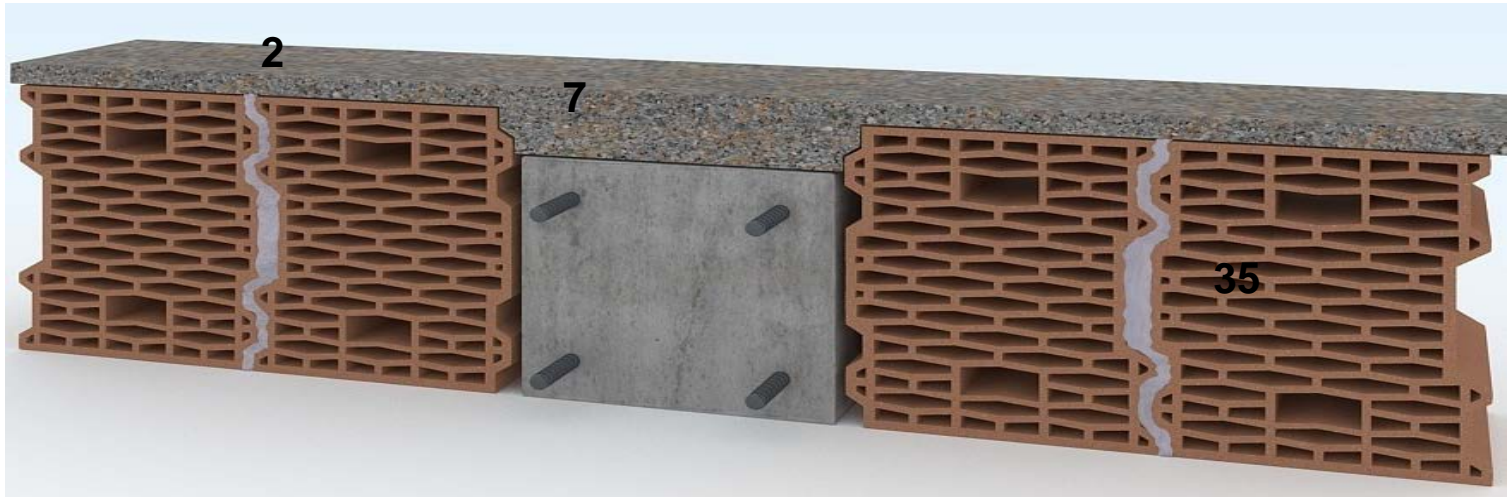
The existence of thermal bridges is one of the biggest problems in modern construction. Their causes are:

Fonte Anit

- The presence of different types of materials in a building
- The lack of homogeneity and the geometrical discontinuity in the structure
- The discontinuity in the layers of thermal insulation

THERMAL BRIDGES - SOLUTION

A wall insulated with Diathonite thermal plaster avoids these problems



The solution with **Diathonite Evolution** consists in providing for a groove between pillar and curtain element (minimum 3 cm) in the designing stage.

This allows to reach the proper insulation needed for thermal correction in pillars and separators, thus preventing any difficult-to-solve building problem during construction.

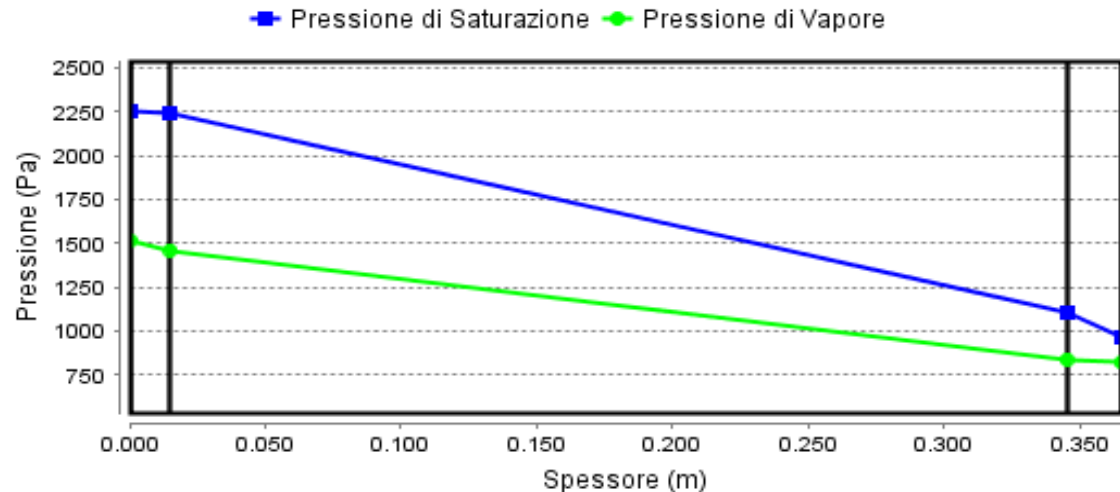
AVOIDING THE FORMATION OF CONDENSATION

Avoiding the formation of condensation

Good insulation should guarantee a higher internal comfort avoiding the formation of mould / condensation



THERMAL-HYGROMETRY: Glaser analysis



Thanks to its high hygrometric properties (breathability $\mu=4$ and capacity of absorbing and releasing vapour $0,35 \text{ kg/m}^2 \text{ h}^{0,5}$ -), Diathonite prevents the formation of condensation.

THE STRUCTURE DOES NOT CAUSE INTERSTITIAL CONDENSATION

THERMAL-HYGROMETRY: Diathonite as a hygrometric lung

Diathonite is highly breathable and permeable
 $\mu=4$

Diathonite is able to absorb and release water vapour,
about $0,35 \text{ kg/m}^2 \text{ h}^{0,5}$

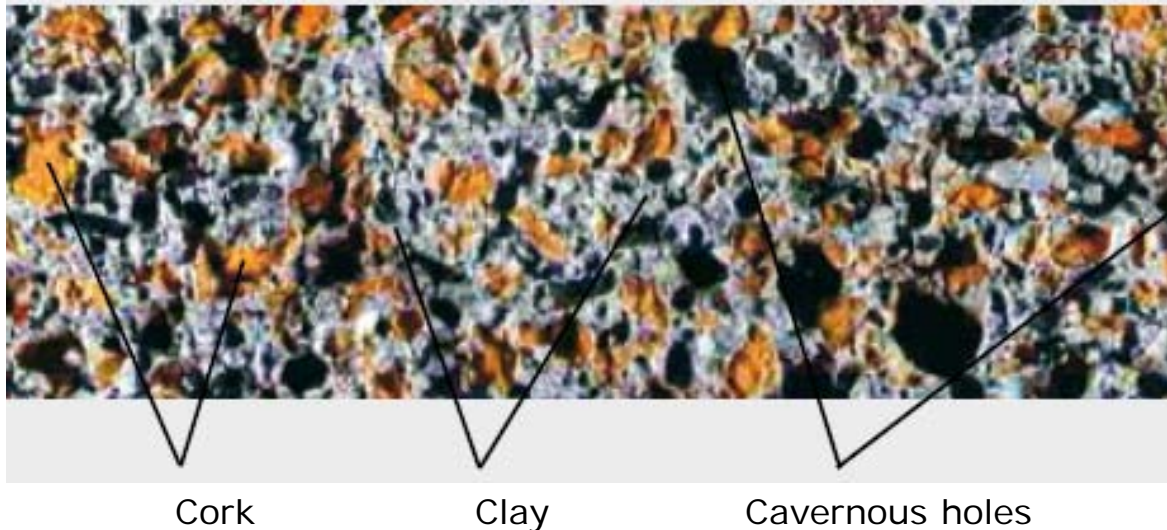
Porous structure of the material, characterized by the presence of many hollowness.

It can absorb and release very fast water vapour, therefore avoiding the formation of superficial condensation.

Diathonite system as the perfect solution against superficial condensation and mould

DIATHONITE: Sound absorption

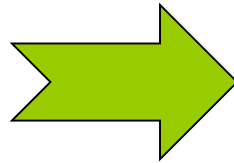
Thanks to its microcavities and hollows, Diathonite can offer a level of sound-absorption that is twice as high as a standard plaster. It can absorb sound waves avoiding reverberation, and improving the acoustical quality of buildings.



DIATHONITE: Sound absorption

$\alpha = 0,70$

(between 500 and 1600 Hz)



Frequenza (Hz)	Coefficiente di Assorbimento acustico (α)
100	0,19
125	0,16
160	0,08
200	0,33
250	0,28
315	0,43
400	0,51
500	0,63
630	0,75
800	0,76
1000	0,74
1250	0,75
1600	0,69
2000	0,66
2500	0,66
3150	0,68
4000	0,71
5000	0,66

DIATHONITE: PROTECTION FROM HEAT

Protecting from heat

Decreasing the T inside the house is an excellent solution to *have good energy saving in A/C and to obtain an healthy room .*

“Insulation materials based on renewable natural raw materials assure better protection from heat than syntetic products”

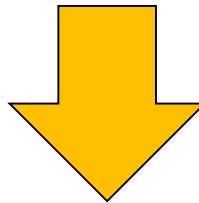
Source: Casa Clima Agency



DIATHONITE: PROTECTION FROM HEAT

Features of the insulation materials suitable for protecting from heat:

- High specific density
- High heating accumulation capacity
- Low value of thermal conductivity

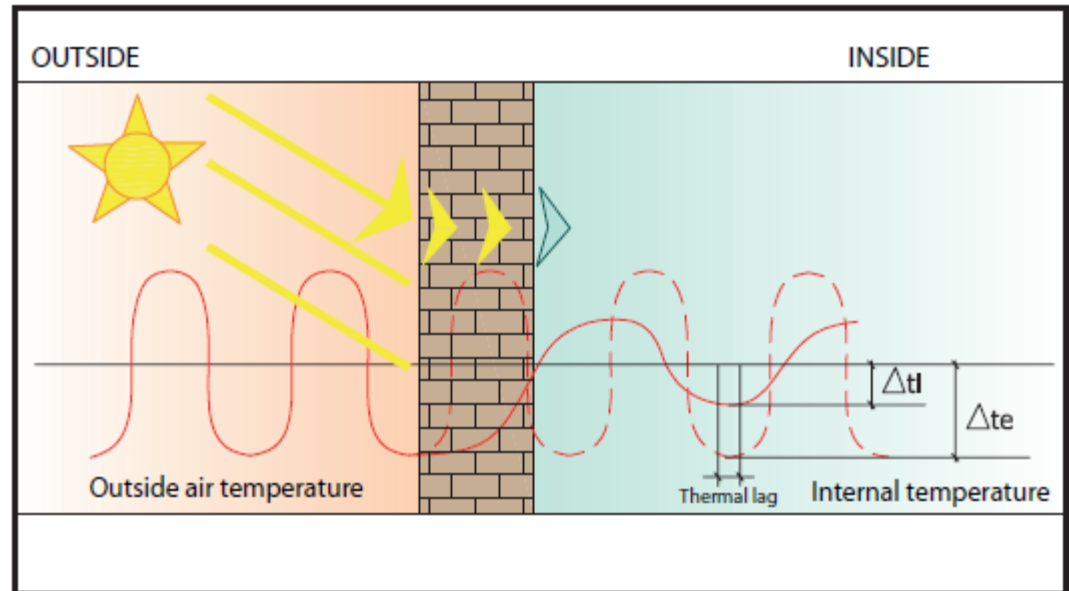


Diathonite Evolution is able to contain the external heat wave and then allows considerable energy savings in summer air conditioning.

THERMAL LAG AND ATTENUATION

THERMAL LAG: the higher the thermal lag, the higher is the time in which the thermal wave enters through the wall and thus the higher possibility to cool down the wall thanks the night ventilation.

ATTENUATION: is an index of the reduction of the width of the thermal wave. If it is a low value then less part of the thermal energy will reach the internal environment.



The picture shows the effects of thermal lag and attenuation of the thermal wave, guaranteed by a correct insulation from heat of an external wall.

THERMAL DIFFUSIVITY

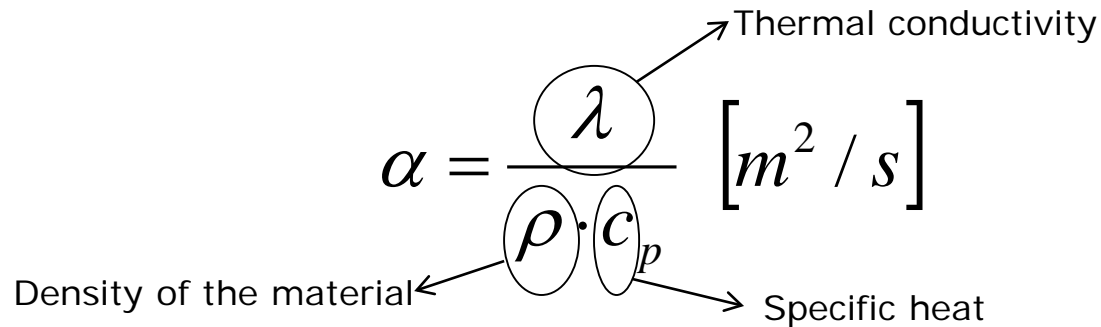
The global parameter to assess the ability of a material to reduce the thermal summer wave is the **THERMAL DIFFUSIVITY**, which can be represented by the “propagation speed” of the energy in the material.

$$\alpha = \frac{\lambda}{\rho \cdot c_p} \quad [m^2 / s]$$

Thermal conductivity

Density of the material

Specific heat

The diagram shows the formula for thermal diffusivity, alpha = lambda / (rho * c_p), with units [m^2 / s]. The variable lambda is circled and labeled 'Thermal conductivity'. The variables rho and c_p are grouped together in a larger oval and labeled 'Density of the material' and 'Specific heat' respectively.

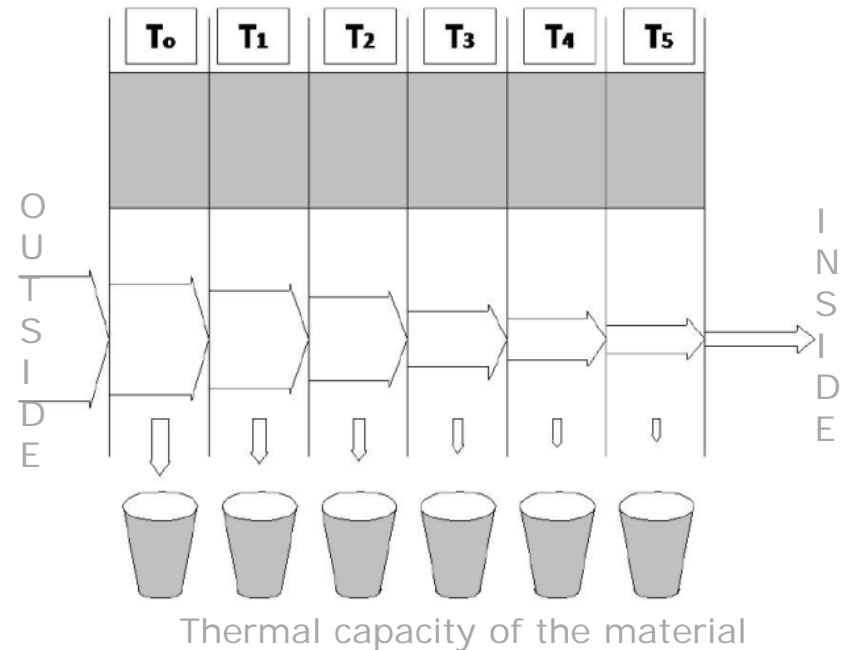
The low value of thermal diffusivity of Diathonite Evolution improves the behavior of structures during summer.

STRUCTURE CHARGING

The charging of the structure depends on:

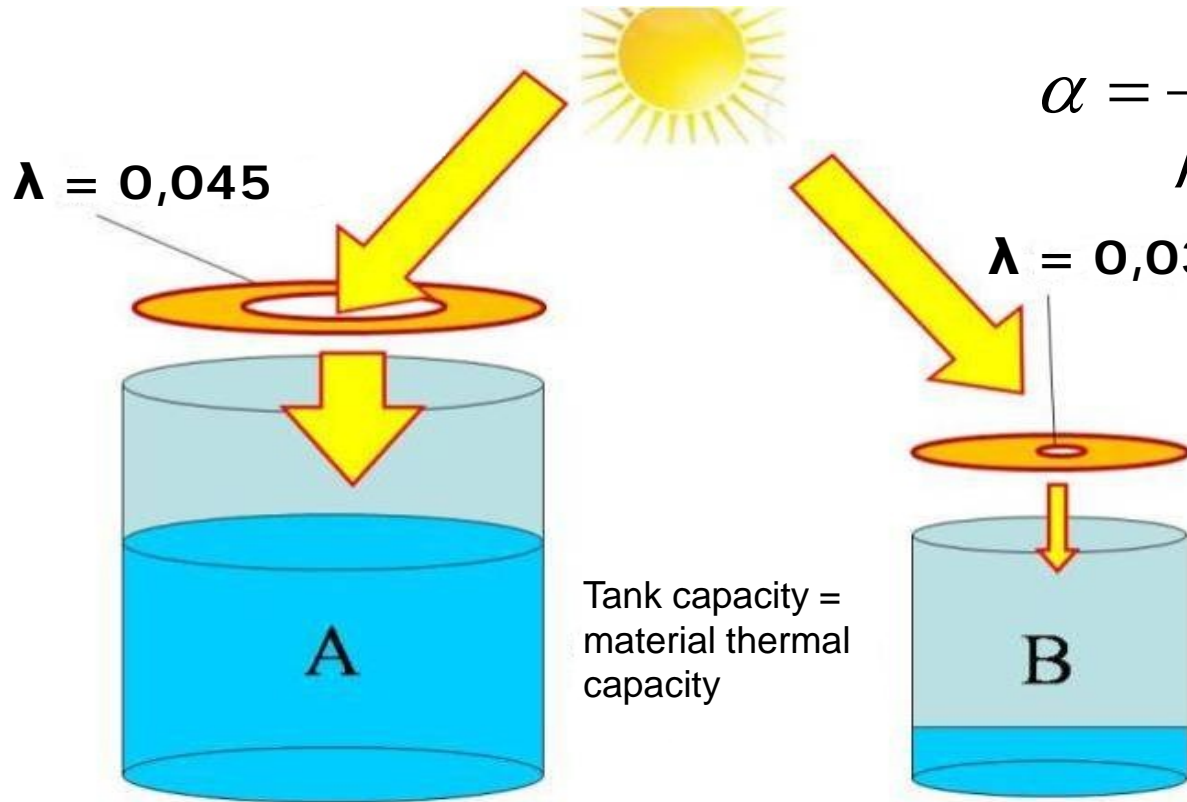
1. Thermal conductivity (λ)
2. Thermal capacity (C)
3. Thermal diffusivity (α)

1. The *thermal conductivity* (λ) acts on the reduction of incoming heat (from outside to T_0)
2. *Thermal capacity* indicates how much heat a material is able to absorb (from T_0 to T_1)
3. *Thermal diffusivity* indicates how fast the thermal wave can enter inside



THERMAL DIFFUSIVITY

$$\alpha = \frac{\lambda}{\rho \cdot c_p} \quad [m^2 / s]$$



DIATHONITE EVOLUTION

$C = 360 [kJ/Km^3]$

8 times higher than a panel

EPS PANEL / EIFS system

$C = 36,25 [kJ/Km^3]$

THERMAL DIFFUSIVITY

	Code	Density ρ [kg/m ³]	Specific heat c [J/kgK]	Thermal conductivity λ [W/mK]	Thermal diffusivity α [m ² /s]
INSULATING MATERIAL					
Cellular concrete	-	300	1000	0,089	0,30
Wood fibre	WF	150	2000	0,040	0,13
Rockwool	MW	100	1030	0,035	0,34
Fiberglass	MW	80	1030	0,035	0,42
Extruded polystyrene foam	XPS	35	1450	0,035	0,70
Sintered polystyrene foam	EPS	25	1450	0,036	0,99
Polyurethane foam	PUR	43	1400	0,028	0,46
Diathonite Evolution		360	1000	0,045	0,13

EXAMPLE: APPLICATION OF DIATHONITE OVER A NON INSULATED STRUCTURE

	esistente	Diathonite		
		Ex 8 cm	Int 8 cm	ex+int
U [W/m ² K]	1.02	0.36	0.36	0.36
Y _{ie} [W/m ² K]	0.42	0.04	0.06	0.02
φ [h]	8h 32'	12h52'	12h46'	13h33'
f _a [-]	41%	10%	16%	5%
M _s [kg/m ²]	285	309	309	309
C _{ip} [kJ/kgK]	50	43	12	14.

	esistente	EPS		
		Ex 6,5 cm	Int 6,5 cm	ex+int 3+3.5
U [W/m ² K]	1.02	0.36	0.36	0.36
Y _{ie} [W/m ² K]	0.42	0.04	0.065	0.02
φ [h]	8h 32'	10h58'	10h42'	12h20'
f _a [-]	41%	11%	18%	6%
M _s [kg/m ²]	287	287	287	287
C _{ip} [kJ/kgK]	50	43	8	14



Diathonite Evolution *References*



Residential Neighbourhood - Alghero - Sardinia



Residential Neighbourhood - Alghero - Sardinia



Touristic Resort – Alghero - Sardinia



Touristic Resort – Alghero - Sardinia



Semi - Detached House – Sassari – Sardinia



Semi - Detached House – Sassari – Sardinia



Apartment House – Villa Simus – Sardinia



Apartment House – Villa Simus – Sardinia



Residential and Commercial Complex – Palermo – Sicily



Residential Neighbourhood – Gallipoli – Apulia



Residential Neighbourhood – Gallipoli – Apulia



Residential Neighbourhood – Naples – Campania



Residential Neighbourhood – Naples – Campania



Luxury Estate “Villa Maddalena” – Venticano – Campania



Luxury Estate “Villa Maddalena” – Venticano – Campania



I.A.C.P. Apartment House – Avellino – Campania



Hotel “Palazzo Sant’Elena” – Foggia – Apulia



Hotel “Palazzo Sant’Elena” – Foggia – Apulia



Residential Neighbourhood “Le Monache” – Perugia – Umbria



Apartment House – Messina - Sicily



“Pianciani’s Palace” – Spoleto - Umbria



C.E.T. – Centro Europeo Tuscolano – Tuscolano - Umbria



C.E.T. – Centro Europeo Tuscolano – Tuscolano - Umbria



C.E.T. – Centro Europeo Tuscolano – Tuscolano - Umbria



Relais “Borgo Torale” – Passignano sul Trasimeno - Umbria



Relais “Borgo Torale” – Passignano sul Trasimonto - Umbria



Relais “Borgo Torale” – Passignano sul Trasimonto - Umbria



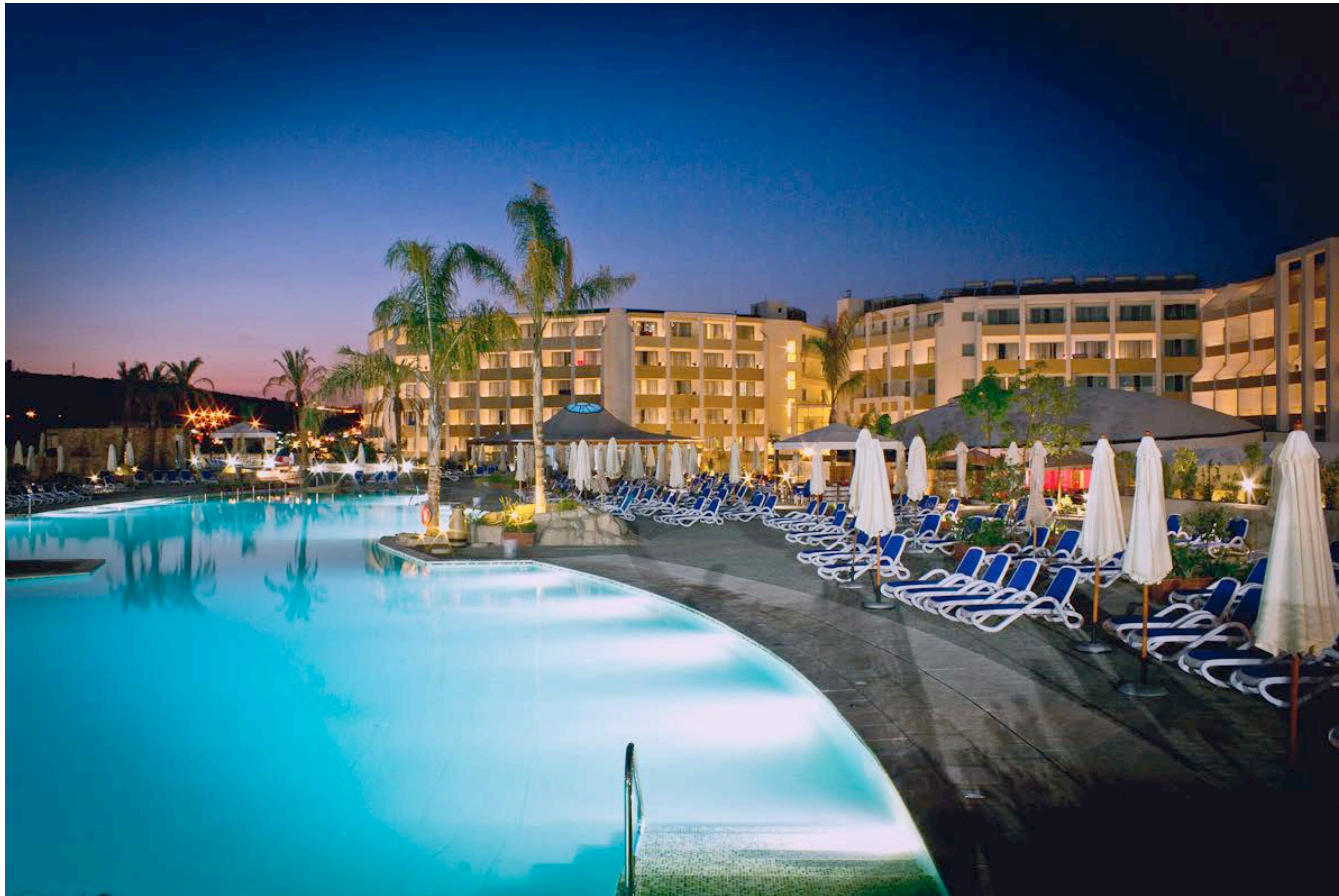
“Savoy Garden” – La Valletta - Malta



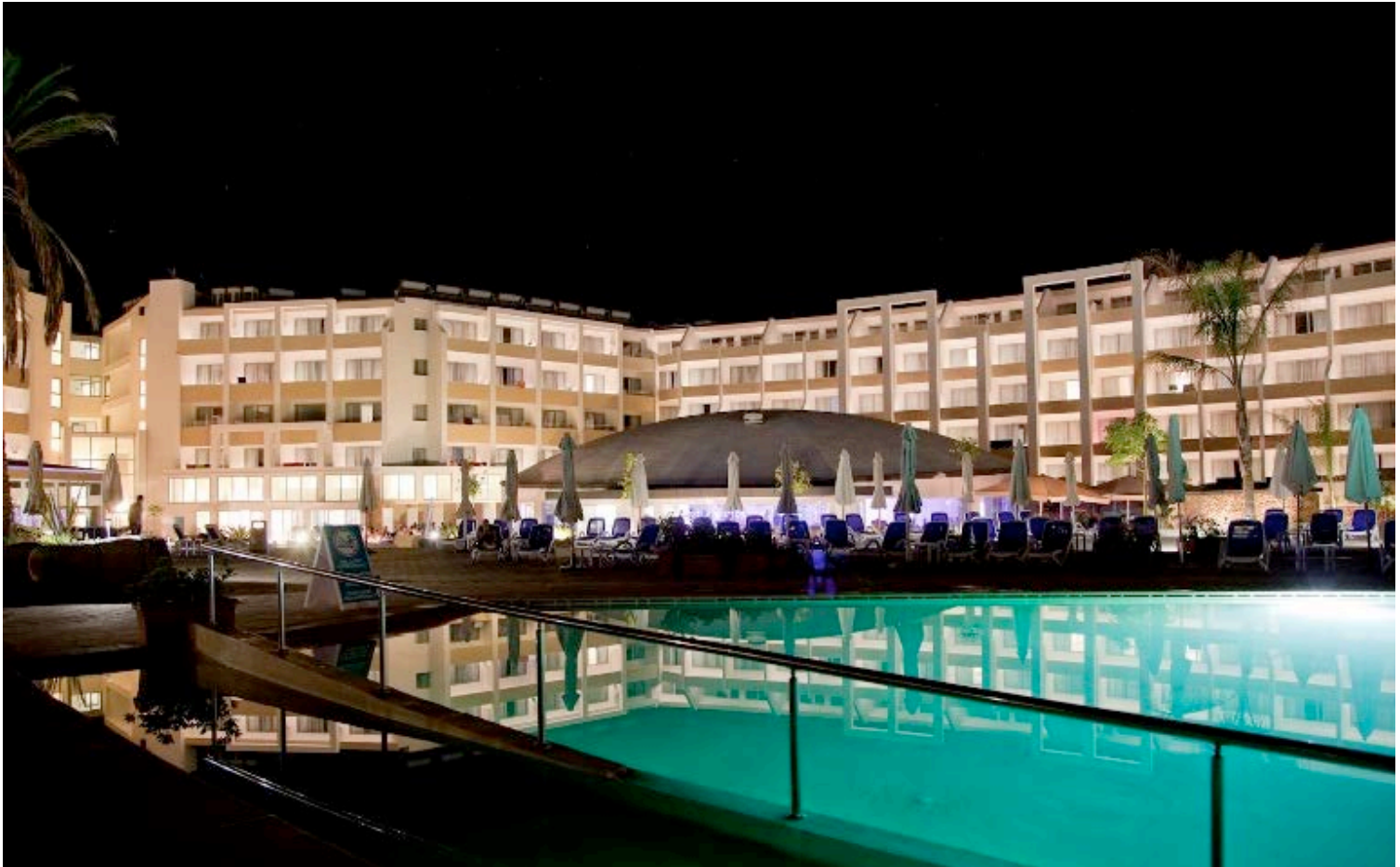
“Savoy Garden” – La Valletta - Malta



Hotel Seabank -- Malta



Hotel Seabank -- Malta



Hotel “Santa Isabel” – La Habana - Cuba



Hostal “De L’Habano Villanueva” – La Habana - Cuba



Restaurant “La Mina” – La Habana - Cuba



Hostal “Los Frailes” – La Habana - Cuba



Hostal “Los Frailes” – La Habana - Cuba



Library “Centenario del Apóstol ” – La Habana - Cuba



Colonial Museum “San Salvador de la Punta” – La Habana - Cuba



Colonial Museum “San Salvador de la Punta” – La Habana - Cuba



Colonial Museum “San Salvador de la Punta” – La Habana - Cuba



Public Library “Parque de Espana” – Medellin - Colombia



Public Library “Parque de Espana” – Medellin - Colombia





Thank you for your attention!

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