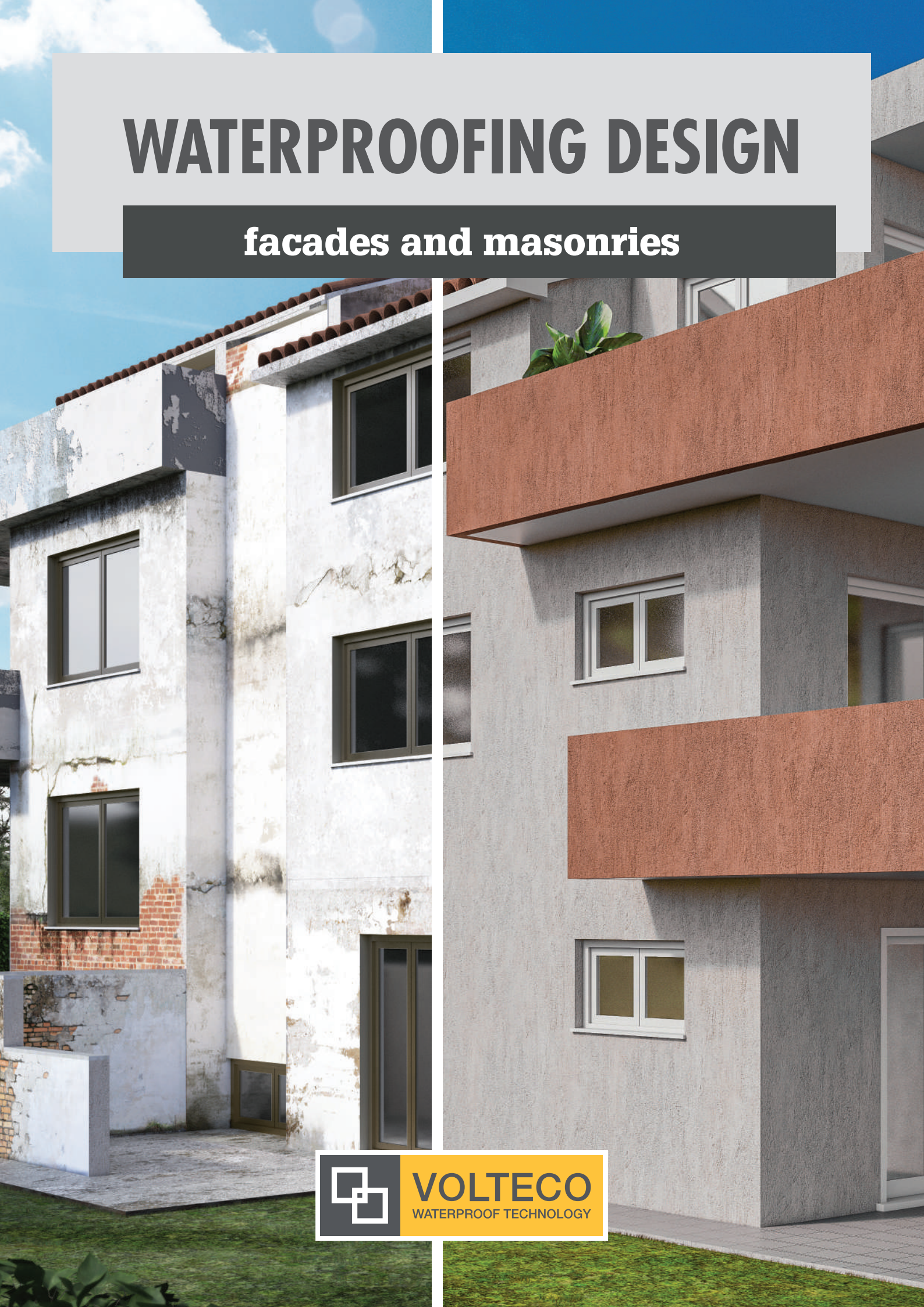
WATERPROOFING DESIGN

facades and masonries



VOLTECO
WATERPROOF TECHNOLOGY

Contents

1. Why protect facades and masonry pag. 4
2. The enemies of the facade pag. 5
3. Aspects to consider pag. 6

Volteco solutions

5. Facade protection pag. 8
6. Product focus - Waterproof facades pag. 10
7. Masonry restoration pag. 12
8. Product focus - Rehabilitated masonry pag. 14
9. Dehumidifying plasters pag. 16
10. Certifications pag. 18
11. Volteco services pag. 19

Waterproofing Design

Why protect facades and walls

Different structural and construction elements often coexist in the facades of houses and blocks of flats, such as **reinforced concrete, plaster and exposed brick**. Because of the 'enemies' to which they are exposed, safety can also be compromised, with the consequent risk of plaster detachment and danger of collapse.

Moreover, the phenomenon of capillary rise often appears in the **walls**. Building materials are indeed porous, absorbing water that rises by capillarity and tries to evaporate from the surfaces of the walls, depositing salts.

Rising damp is a serious problem: not only it causes aesthetic, structural and hygrothermal damages to the walls, but it can also compromise the health of living areas.

Rain

Smog

Cold

Climate and thermal stress

The enemies of the facade

Pollution

Marine areosol

Chemical agents

Humidity

Gas

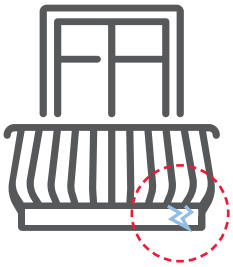
Hot

Wind

Aggressive vapours

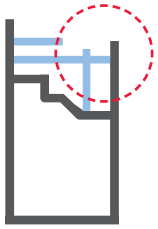
Ice

Aspects to consider



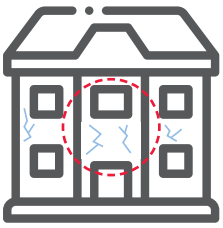
Deteriorated fronts, parapets, balconies and accessory elements

The restoration of fronts and parapets, often damaged by time and by the aggressive action of rainwater, prevents serious **aesthetic and structural damages**.



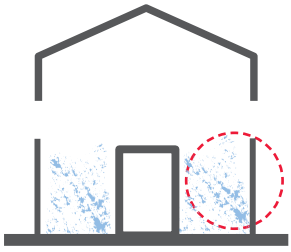
Structural restoration of degraded reinforced concrete with exposed iron

In case of repair of highly degraded reinforced concrete with exposed reinforcement bars, it is necessary to propose an effective and durable maintenance cycle for the **definitive recovery of the structure**. The restoration of reinforced concrete varies, depending on whether it is cortical (small reconstructions) or structural (very thick).



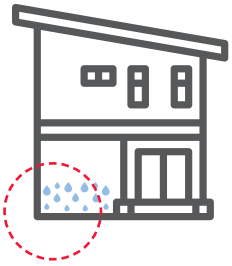
Facade cracks

Cracks in the facade can be **static** or **dynamic**. In particular the static cracks concern the surface and are due to the **settlement of the structure, of the ground and of building materials**. Dynamic cracks are cracks that form due to dynamic stresses, caused for example by **vibrations, thermal variations**, etc..



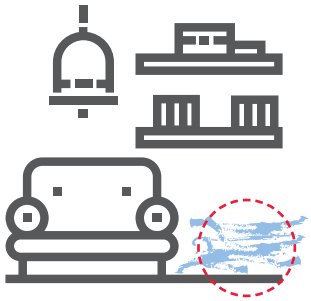
Peels off masonry and plaster detachment

IIn some cases, masonry peels off due to the peeling of paint that loses adhesion, or because it is structurally rigid and cannot follow the movement of the substrate. In other cases, instead, the detachment of the plaster is due to the aggression of **aerosol solutions in the air** and **rising damp**. All this causes, in the most serious cases, the **detachment** and **fall of portions of plaster**.



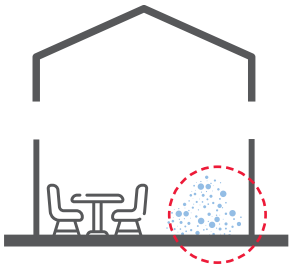
Rising damp

Covering a part of the wall, with rising damp, with stone or similar material further prevents the masonry from **disposing of excess water** and therefore increases the problem. At lower altitudes, **salinity** tends to increase due to humidity, as the **lack of evaporation** aggravates the problem both inside and outside.



Damp wall

The presence of water in the masonry causes a **reduction in the insulating power** of the materials with consequent excessive heating costs, use of dehumidifiers, continuous work of redoing plaster, painting, wooden floors and usually, ruined furniture and deteriorated upholstery.



Mould

The mould in the plaster is a fungus that feeds on dampness. Its spores are harmful and permeate wardrobes and clothes. **Excess dampness in the environment** due to a damp and a cold wall causes high condensation, especially in winter and leads to an overall unhealthy environment that can result in aches, discomfort and even illnesses such as colds, sinusitis, a sore throat, arthritis, rheumatisms, etc.

FACADES PROTECTION

Waterproofing cycle

1 **SANOFER** CE UNI EN 1504-7

Protective corrosion inhibitor for reinforcing bars.

2 **FLEXOMIX 30** CE UNI EN 1504-3 PCC **R3**

Thixotropic, fibre-reinforced mortar with low elastic modulus.

3 **FIBROMIX 40/ FIBROeRASO** CE UNI EN 1504-3 CC **R4** CE UNI EN 1504-2

Thixotropic, fibre-reinforced mortar with medium elastic modulus.

4 **CP1** CE UNI EN 1504-2

Waterproof, flexible, anti-carbonating finishing primer.

+ FLEXONET/XNET

Flexible polypropylene meshes.

5 **CPØ** CE UNI EN 15824

Thick, colored finishing coating.

Why choose the CP System?

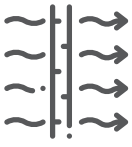
The ideal solution for facade protection must consider the following issues:

1. create an **effective protection** of the structures against the absorption of aggressive environmental agents;
2. **waterproof structures** against atmospheric phenomena, avoiding the stress caused by freezing/thawing cycles;
3. create an effective **UV barrier**;
4. **seal** existing and posthumous **cracks** (CBA), adapting to the deformations of the underlying support.

The **CP System** meets all the set objectives thanks to its features:

DEFORMABILITY

IMPERMEABILITY



BREATHABILITY

RESISTANCE

Product focus - Waterproof facades

SANOFER

Creates a barrier against the corrosion of the reinforcement rods

Cement-based protective coating specific for protecting reinforcement rods..

CE UNI EN 1504-7

visit the product page

FLEXOMIX 30

Restores and finishes in a single solution

Cement-based modified polymer mortar with a low modulus of elasticity, thixotropic and fibre-reinforced, for the volumetric repair of re-built reinforced concrete in a single solution, with an excellent surface finish.

CE UNI EN 1504-3 PCC **R3**

visit the product page

FIBROMIX 40

Structurally restores reinforced concrete structures

Fibre-reinforced thixotropic mortar with medium modulus of elasticity and controlled shrinkage, ideal for the structural repair of reinforced concrete.

CE UNI EN 1504-3 CC **R4**

visit the product page

FIBROeRASO

Structurally restores, levels and waterproofs concrete

A semi-rapid thixotropic mortar with medium modulus of elasticity and controlled shrinkage, based on sulfoaluminate cement and reinforced with synthetic microfibres, suitable for structural repairs, smoothing and protection of reinforced concrete with an excellent surface finish.

CE UNI EN 1504-3 CC **R4**

CE UNI EN 1504-2

visit the product page

CP1

Protects and waterproofs

Waterproof, breathable and flexible white cement-based finishing primer, ideal for protecting facades thanks also to its effective anti-carbonation action.

CE UNI EN 1504-2 EPD ITALY

visit the product page

CPØ

Protects and finishes the facades

Thick finishing coating in paste, colored, organic mineral, with high breathability and water repellency for exteriors and interiors.
Available in four different grain sizes:
0.4 / 1 / 1.2 / 1.5 mm.
Very wide range of colours.

CE UNI EN 15824

visit the product page

MASONRY RENOVATION

Restoration cycle

1 **TRIPLEZERO** WTA

Moisture barrier with superhydrophobic creamy emulsion.

2A **CALIBRO PLUS EVAPORATION** CE UNI EN 998-1

Salt-resistant rough coat + Damp-proof, salt-resistant, anti-condensation plaster.

2B alternatively **CALIBRO NHL** EPD CE UNI EN 998-1

> 2 PRODUCTS IN 1(rendering + plaster) - Plaster with natural hydraulic lime.

3 **BI MORTAR PLASTER SEAL** CE UNI EN 1504-3 CLASSE **R3**

Skirting with waterproof plaster.

4 **X-LIME**

Finishing plaster with high breathability.

Why choose Sistema Calibro?

To definitively solve the **problems of plaster detachment**, **salt stains and infiltration due to rising damp**, a highly resistant shield against humidity can be created by means of a chemical barrier. This intervention can be combined with a **dehumidifying cycle**, which involves:

1. **Reinforcement:** creation of a clinging surface;
2. **Dehumidifying plaster:** allows transpiration and expulsion of moisture.

Advantages:

- **ease of application:** simple application without complex equipment, applicable indoors and outdoors;
- **durability:** long-term solution against damp;
- **effectiveness:** keeps masonry dry, preventing structural and visual damage, and ensures a healthy environment.

TRIPLEZERO
Non-toxic

RENOVATION SYSTEM
Universal solution

CALIBRO NHL
Natural lime

CALIBRO PE INTONACO
Coefficient of water-vapour permeability

Product focus - Restored walls

TRIPLEZERO

Stops rising damp in walls

A creamy emulsion, ready for use, super hydrophobic, non-toxic. To obtain a chemical barrier, creating a "shield" that is extremely resistant to rising damp in the wall.

WTA

visit the product page

CALIBRO SYSTEM

Restores walls and environments with rising damp and condensation

Dehumidifying system suitable for anti-humidity, anti-salting and anti-condensation treatments on all types of damp masonry, both indoors and outdoors. Consisting of two dehumidifying components Calibro Rinzaffo and Calibro Plus Evaporation Plaster to be used in succession.

CE UNI EN 998-1

visit the product page

CALIBRO NHL

Restores structures of historical or artistic interest with rising damp and condensation

Dehumidifying system suitable for anti-humidity, anti-salt and anti-condensation treatments on all types of damp masonry, both indoors and outdoors. Plaster certified in the version based on natural hydraulic lime NHL according to EN 459, eco-compatible.

CE UNI EN 998-1 EPD ITALY

visit the product page

BI MORTAR PLASTER SEAL

Plasters and waterproofs structures

Fibre-reinforced plaster for skirting and waterproof covering. Suitable for smoothing both mixed and reinforced concrete walls, even for areas subject to infiltration.

CE UNI EN 1504-3 CLASSE **R3**

visit the product page

X-LIME

Levels and finishes in a breathable manner

A white ready-mixed, lime-based, hydrophobic finishing plaster.

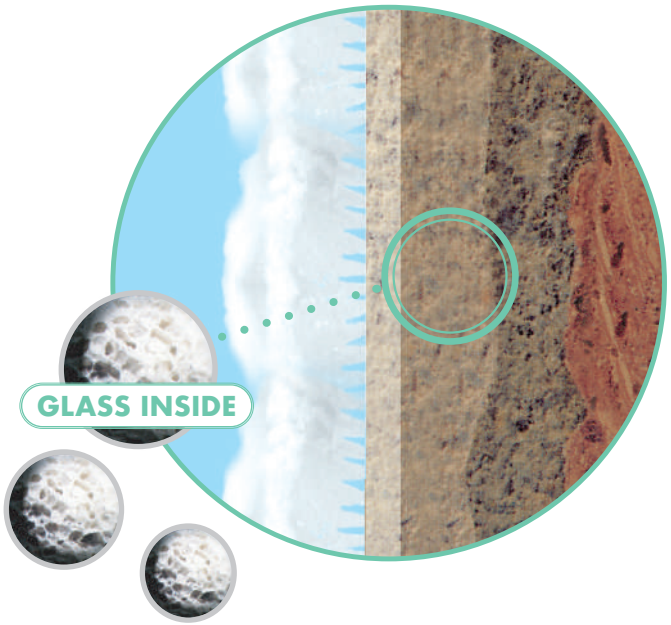
visit the product page

Dehumidifying plasters

Sustainability and Performance

> The heart of the Calibro System

The heart of **Calibro System** is made from **100% recycled glass**. The glass is ground, treated, granulated and expanded by means of a process from which a round granulate with a thin pore, of a milky colour, is created and contains many small air chambers with a variable diameter.



Thanks to these characteristics, it is able to create a physical phenomenon of **constant exchange of ventilation/aeration** in the walls, favouring and accelerating the expulsion towards the external environment of the humidity in the form of vapour, **avoiding** the formation of **saline crystallization on external surfaces**.

> Natural lime

According to the UNI EN 459-1: 2010 standard, products obtained by cooking natural marls or homogeneous mixtures of limestone and clayey materials are referred to as **Natural Hydraulic Limes**.

Natural hydraulic limes are marked with the acronym NHL (Natural Hydraulic Limes).

Among the natural hydraulic limes, there is a distinction based on mechanical strength at 28 days.

There are 3 classes of natural hydraulic limes: NHL 2.0 – NHL 3.5 – NHL 5.0.

Product	Compressive strength	
NHL 2	7 gg	28 days
NHL 3.5		> 2 a < 7
NHL 5		> 3.5 a < 10
	> 2	> 5 a < 15

The production of lime offers a **lower energy consumption** (about 30%) compared to that required for the production of cement binders. Plus, with the completion of the lime cycle, it reabsorbs 100% of the **carbon dioxide** released into the atmosphere during the transformation of limestone into calcium oxide.

Why use a dehumidifying plaster?

To answer this question, the Volteco team created some **comparative models between non-dehumidifying and anti-condensation dehumidifying Volteco plasters**.

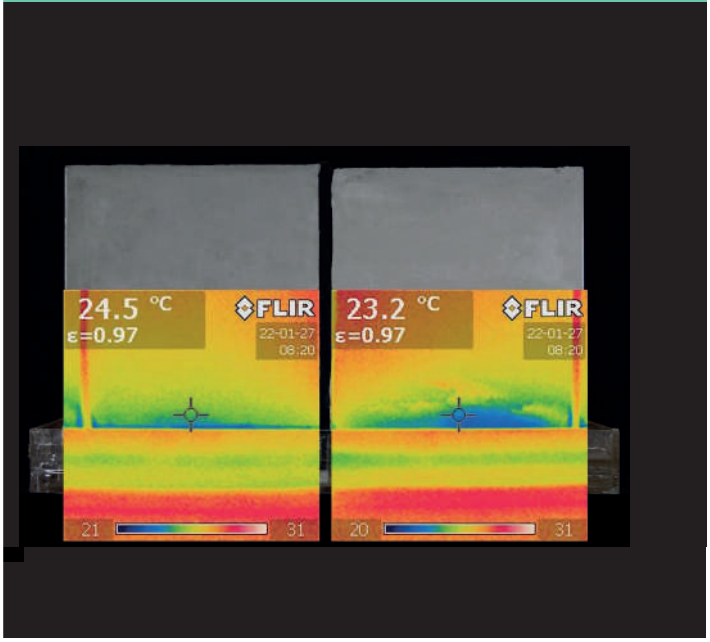
Some stations were recreated and subjected for several months to a continuous presence of water with a high salt concentration. The results were absolutely significant (image no.1).

It has been highlighted that a non-dehumidifying plaster starts to show the first humid areas after just 60 days, while after 120 days the first salt formations begin to form, leading to the appearance of mould and detachments after 150 days, visible and measurable even with a thermal camera (image no. 2).

Volteco's Calibro dehumidifying system did not present any aesthetic damage.

Image no. 1

Image no. 2



Certifications

Facade

The **UNI EN 1504** standard establishes the procedures and characteristics of products for the repair, maintenance and protection of reinforced concrete (r.c.) structures to guarantee the nominal life of the works.

Nominal life: is the number of years that a structure, if subjected to ordinary maintenance, must remain functional for its purpose. Nominal lives are:

- **Temporary works:** ≤ 10 years
- **Ordinary works,** bridges, infrastructures of medium importance: ≥ 50 years
- **Major works**, bridges, strategic infrastructure ≥ 100 years

The structure must be designed to maintain strength, stability and functionality throughout its nominal life.

Structure of the standard:

- **Part 1:** Terms and definitions
- **Parts 2-7:** Product characteristics for CE marking
- **Part 8:** Manufacturer's conformity assessment
- **Part 9:** General principles for the use of products and systems
- **Part 10:** Installation and quality control on construction sites

Details of the relevant parts:

- **Part 2:** Specifications for products and systems to increase the durability of concrete through coatings and impregnations.
- **Part 3:** Requirements for structural and non-structural repair products and systems.
- **Part 7:** Corrosion protection of reinforcement.

Phases of the restoration intervention:

1. Diagnosis of the causes of degradation
2. Choice of methods and systems to restore the structure to its original efficiency
3. Preparation of concrete and reinforcement
4. Choice of products/systems compliant with the standard and application by qualified operators
5. Compliance with health and safety standards of operators and the environment

It is essential to protect the structures from the absorption of aggressive environmental agents, preventing corrosion of the reinforcement (anti-carbonation effect), waterproofing against atmospheric phenomena, freeze/thaw cycles, UV rays, and sealing cracks.

Humidity

Dehumidifying and restoring a building also means safeguarding our historical and cultural heritage. For this reason, specific interventions in these areas acquire considerable importance. The **UNI EN 998-1** standard defines the rules for the classification of construction products and specifications for mixtures suitable for the preparation of mortars and plasters, both for internal and external use..

In relation to their intended use, we find:

- generic mortars (GP)
- lightweight (LW)
- coloured (CR)
- single-layer (OC)
- renovation (R)
- heat insulating (T)

Of the various sources of **degradation**, the most important to be analysed in its various forms is certainly moisture. In particular, dehumidifying plasters must meet the requirements of class R. Dehumidifying plaster has the fundamental purpose of **preventing damage due to rising damp through the capillaries of masonry, both internal and external.**

It is important to emphasise that a good plaster does not need high mechanical strength; on the contrary, the **elastic modulus and compressive strength** must be lower than those of the substrate.

Volteco services
at your disposal

> Services for the designer

BIM
Building Information Modeling
CUSTOMIZE YOUR PROJECT

> Support for professionals and installers

training VOLTECO

> Qualified installers

TEAM H2OUT
NETWORK SPECIALISTICO BY VOLTECO

> More than 2.200 references: www.volteco.com

VOLTECO durability check up

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COMPANY CERTIFIED MANAGEMENT SYSTEM QUALITY - ISO 9001 - ENVIRONMENT ISO 14001 - SAFETY ISO 45001

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