The TECHLAM® ventilated façade is a cladding system, consisting of fixing a system of profiles to the external face of the walls of the enclosure. The external face is then protected by an insulation layer and the profiles support the ceramic panels and create an air cavity between the wall and the outer ceramic material. The TECHLAM® ventilated façade technique ensures the presence of an air cavity covering the whole wall which allows air to flow in the façade, protects the building from rainwater and prevents condensation in the air cavity.

The elements of the TECHLAM® ventilated façade
1. Insulating material fixed to the wall of the enclosure to clad.
2. Substructure consisting of loadbearing and adjustable profiles, applied to the exterior of the building, on which the exterior cladding is hung.
3. Air cavity between the insulating material and the TECHLAM®.
4. Continuous facing (exterior finish) which remains separate from the wall of the enclosure.

Advantages of TECHLAM® Ventilated Façades
- Savings in energy costs as it facilitates thermal and acoustic insulation, and improves waterproofing and fire resistance.
- Significant reduction in wear and tear over time and therefore lower repair costs.
- Reduction in maintenance costs. It does not need to be repainted.
- Reduction in damp through less condensation.
- Anti-graffiti treatment.
- Elimination of damp and efflorescence on external walls due to the system and the materials used.
- Elimination of surface condensation.
- Ease of installation and replacement if required.
- Significant improvements in thermal and acoustic insulation of the building compared to other commonly use products.
- The fixing and installation systems make it suitable for use in restoration projects.
TECHLAM®

Levantina was the first company to equip its factories with the advanced technology to manufacture this thin ceramic.

TECHLAM® is a 3mm thick ceramic sheet weighing 7.1 Kg/M² and is available in panels of up to 1000x3000 mm. These characteristics mean that this product can provide unique solutions for all kinds of applications in the fields of architecture and interior design.

An array of building projects can be carried out with this new concept in functionality. Its versatility in terms of size, colour, ability to be used with other materials and technical properties of durability and flexibility of installation make this material a benchmark for many applications, including façades.

It is easy to install and so saves time and money during construction of both new-build and restoration projects.

TECHLAM® Ceramics 04

TECHNICAL PROPERTIES

Versatility: TECHLAM® is available in large panels (1000x3000 mm) which can be cut to all sizes.

Impermeability: Level of moisture absorption close to 0, impermeable and resistant to liquids.

Hygienic surface: It does not emit noxious substances or allow formation of mould, fungus or bacteria, therefore making it completely compatible with foodstuffs.

Easy to clean: It does not require special care or cleaning products.

Colours do not change: The absence of organic pigments makes it resistant to UV radiation and the most severe climatic conditions.

Resistance to fire and high temperatures: It has a spread of fire index of 0.

Resistance to chemical products: Solvents, disinfectants and detergents.

Resistant to bending: Has a high resistance to breakage.

Resistance to wear and tear: Its surface and hardness make it highly resistant to scratching and abrasion.

Environmentally friendly: 100% natural. Does not emit any substances to the environment and can be easily recycled to manufacture sand and cement or similar products.
**BASIC Collection**

Basic Neut
Basic Sand
Basic Capuccino
Basic Tardor
Basic Coffee
Basic Clay
Basic Orange
Basic Gorri
Basic Blau
Basic Green
Basic Pistaccio
Basic Caelum
Basic Grey
Basic Antracita
Basic Black

**HYDRA Collection**

Hydra Argen
Hydra Plomo
Hydra Beige
Hydra Moka
Hydra Brown
Hydra Wengue

Finishes: matte
Thickness: 3mm, 3+mm, 3+3mm, 3+3+3mm.

Sizes

- 100x300 cm
- 100x100 cm
- 50x100 cm
- 50x50 cm
- 30x50 cm
**VULCANO Collection**

- Vulcano Lahar
- Vulcano Vapor
- Vulcano Ceniza
- Vulcano Humo
- Vulcano Roca

Sizes:
- 100x300 cm
- 100x100 cm
- 50x100 cm
- 50x50 cm
- 30x50 cm

Finishes: matte
Thickness: 3mm, 3+3mm, 3+3+3mm.

**ZAHIR Collection**

- Zahir Perle
- Zahir Crème
- Zahir Argile
- Zahir Gris
- Zahir Noir

Sizes:
- 100x300 cm
- 100x100 cm
- 50x100 cm
- 50x50 cm
- 30x50 cm

Finishes: matte
Thickness: 3mm, 3+3mm, 3+3+3mm.
MADEIRA Collection

- Madeira Fresno
- Madeira Haya
- Madeira Roble
- Madeira Teca
- Madeira Nogal
- Madeira Cerezo
- Madeira Embero Gris

Finishes: matte
Thickness: 3mm.3+mm.3+3mm.3+3+3mm.

Sizes
- 100x300 cm
- 100x100 cm
- 50x100 cm
- 50x50 cm
- 30x50 cm

BLIZZARD Collection

- Blizzard Capuccino
- Blizzard Neu
- Blizzard Grey
- Blizzard Cendra
- Blizzard Black

Finishes: matte
Thickness: 3mm.3+mm.3+3mm.3+3+3mm.

Sizes
- 100x300 cm
- 20x100 cm

Madeira Collection special sizes
The TECHLAM® 3+ system of ventilated facades which can be used in new-build or restoration projects is composed of TECHLAM® 3+ fixed to a metal substructure using adhesive and mechanical fixings.

The substructure consists of vertical aluminium profiles and their fixings intended to be placed on flat and vertical surfaces, made of brick, cement, metal or wood structures.

Below we present four fixing systems for TECHLAM® 3+ and the aluminium substructure. These four systems are:

- **QD** – DIRECT CHEMICAL FIXING
- **RG** – CHEMICAL HOLDING SYSTEM
- **RQAM** – CHEMICAL HOLDING SYSTEM + MECHANICAL SUPPORT
- **RMAM** – MECHANICAL HOLDING SYSTEM + MECHANICAL SUPPORT
01. SUPPORT Bracket
02. RETENTION Bracket
03. Vertical T Profile
04. BOSTIK SIMSON Adhesive
05. Double-sided tape
06. TECHLAM® 3+ sheet
07. QD – DIRECT CHEMICAL FIXING
01. SUPPORT Bracket
02. RETENTION Bracket
03. Vertical T 40 Profile
04. Vertical T 35 Profile
05. HORIZONTAL Profile
06. Profile WITHOUT RETENTION
07. BOSTIK SIMSON Adhesive
08. TECHLAM® 3+ sheet

RQ – CHEMICAL HOLDING SYSTEM
RQAM - CHEMICAL HOLDING SYSTEM + MECHANICAL SUPPORT

01. SUPPORT Bracket
02. RETENTION Bracket
03. Vertical T 48 Profile
04. Vertical T 35 Profile
05. HORIZONTAL Profile
06. Profile "7" WITH RETENTION
07. BEARING Profile
08. TECHLAM® 3+ sheet
RMAM - MECHANICAL HOLDING SYSTEM + MECHANICAL SUPPORT

01. SUPPORT Bracket
02. RETENTION Bracket
03. Vertical T 40 Profile
04. Vertical T 35 Profile
05. HORIZONTAL Profile
06. Profile WITH RETENTION
07. RETENTION frame
08. BEARING Profile
09. TECHLAM® 3+ sheet
TECHNICAL DOCUMENTATION INCLUDED

It has all the necessary construction details for each of the fixing models to carry out your VENTILATED FAÇADE building project with TECHLAM®. They are available in either DWG or PDF format.

- Details of fixings
- Detail of cladding join
- Detail for parapets
- Details for external corners
- Details of the frames
  - Details of horizontals (studs)
  - Details of verticals (lintels and flashing boards)
- Perspective application to cladding
- General section with corner finishes
- Details of PCD 1200 profile assembly
- Plans for finding details
COMPLIANCE WITH NATIONAL LAWS

Structural safety
The cladding system of ventilated façades described does not contribute to the stability of the building and the Basic Requirements of Structural Safety do not therefore apply to it. The structural behaviour of the ventilated façade must be such that it does not compromise compliance with the rest of the Basic Requirements and in particular those of Safety of Use and Occupation, as indicated in the Law on Building Planning: “Safety of use, so that normal use of the building does not involve a risk of an accident to people” (art.3.1.b.3.) and other functional aspects of the building elements or the facilities which allow satisfactory use of the building” [art.3.1.c.4]. The support of the ventilated façade system, usually composed of an enclosing wall, must comply with the regulations relating to the relevant essential requirements of structural safety, taking into consideration the actions and stresses caused by installing the ventilated façade. The join between the substructure of the system and the subsequent enclosure must be planned so that the extreme tensions limit and the limit of durability values are not exceeded during the period of use.

Safety in case of fire
The construction of the enclosure, including the insulation, must comply with the TCB, Basic Document on Safety in case of fire (BD-SF), in which it refers to stability when faced with fire, as well as the reaction to fire of the other materials used.

In accordance with the Decision of the EU 96/603, the ceramic cladding material is classified as A1, without the need for tests, so it complies with the requirement in TCB-BD-SF relating to the exterior spread of fire (SF, point 1.4) for the exterior cladding materials of the façade and the interior surfaces of the ventilated chambers of the façade. The cladding material has a reaction to fire classification superior to that required by the regulation.

Safety of use
In the lower areas of the façade, e.g. ground floors next to areas accessible to the public and when the risk of impact is low or zero, it is recommended that the panels be fixed with mortar or else have an intermediate complementary crossbeam (not to be included in the calculation of the action of wind).

Health
The supporting wall of the ventilated façade system must guarantee the minimum level of impermeability required for the building it is incorporated in, as described in the Technical code for Building TCB-BD-HS relating to health in order to satisfy the basic requirement for protection against damp (HS 1). As the system is described in the Technical Report, the ventilated air chamber can be considered “a very highly resistant barrier to water leaks” (B3) as described in TCB-BD-HS, HS1, section 2.3.2. In any case special attention will have to be paid in the design of the façades to incorporating windows and lighting elements as well as the correct solution to specific points, the exterior fixings, etc. to achieve appropriate impermeability at these points so as to avoid the accumulation and leaking of water.

Acoustic Protection
The complete enclosure solution and especially the support element plus the insulation must conform with the requirements in the TCB-BD-HS relating to acoustic protection. The construction solution of the meeting point of the façades with the vertical separation elements will have to be studied so that the transmission of noise through the sides is avoided.

Energy saving
The complete enclosure building solution must satisfy the requirements of the Technical Code for Building TCB-BD-HS, relating to energy saving, as far as hygrothermic behaviour is concerned. “In calculating thermal transmission, as set out in Appendix E of the TCB-BD-HS, the air chamber will be treated as a “chamber of very ventilated air” and the total thermal resistance of the enclosure can be obtained disregarding the thermal resistance of the air chamber and the other layers between the air chamber and the exterior environment and including a superficial exterior resistance corresponding to calm air, equal to the superficial interior resistance of the same element (HE-1, Appendix E),”
Tests of adhesion strength ceramic

Tables of results after tests:

**ENVIRONMENT:** 21 days at 23ºC and 55% R.H. 70ºC: 21 days at 70ºC

**WATER:** 21 days immersed in water at room temperature

**CYCLES 1:** Cycles of 70ºC + room temperature + immersion in water

<table>
<thead>
<tr>
<th></th>
<th>AMBIENT</th>
<th>70ºC</th>
<th>WATER</th>
<th>CYCLES 1: 70ºC+room+water</th>
<th>CYCLES 2: water+23ºC+70ºC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Primer</td>
<td>33.5 Kg/cm</td>
<td>34.1 Kg/cm</td>
<td></td>
<td>33.5 Kg/cm</td>
<td>34.1 Kg/cm</td>
</tr>
<tr>
<td>With Primer</td>
<td>37.1 Kg/cm</td>
<td>36.8 Kg/cm</td>
<td></td>
<td>37.1 Kg/cm</td>
<td>36.8 Kg/cm</td>
</tr>
</tbody>
</table>

These adhesion strength tests confirm the enormous resistance of the adhesive on the ceramic tile in real conditions of use.

Tests of adhesion strength – ceramic with mesh backing + PU

Tables of results after tests:

**ENVIRONMENT:** 21 days at 23ºC and 55% R.H. 70ºC: 21 days at 70ºC

**WATER:** 21 days immersed in water at room temperature

**CYCLES 1:** Cycles of 70ºC + room temperature + immersion in water

These adhesion strength tests confirm the enormous resistance of the adhesive on the ceramic tile in real conditions of use reinforced with a combination of fibre glass netting + PU.

Resistance to wind

This system has been tested on a façade bench submitted to RESISTANCES TO SUCTION AND PRESSURE LOADS FROM THE WIND according to DRAFETAG 034 with sheets of TECHLAM® 3+, and the results were positive and within the limits.

On the other hand, in the RESISTANCE TO IMPACT test the façade complies with category III use.

**STRUCTURAL CALCULATION**

The actions on the Ventilated Facade system were calculated according to TCB-BDSC-HS -AE relating to Building Actions with the lead increase coefficients of actions in TCB-BD-SE relating to Structural Safety.

For the calculation of the system it is considered that the ceramic sheets must support the load of the wind (pressure/suction) and transmit it together with its own weight across the substructure and the fixings to the support. The ceramic sheets, fixings, substructure and fasteners must withstand the forces produced by the wind, as well as its own weight.

For buildings of up to 30m and for the limitations in TCB-BD-SE-AE relating to the action of the wind these were determined according to the Basic Document mentioned above using the wind coefficients of pressure and suction in Appendix D of the Basic Document (table D.1) as a function of the slenderness of the building and the position of the sheet, considering as an area of influence that of the panel itself.

For greater heights and/or for those cases outside the field of application of the Basic Document or when actions of the wind are predicted to be over those considered in TCB-BD-SE-AE it will be necessary to carry out a specific study to determine the actions of the wind as well as the wind coefficients of pressure/suction.
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