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Single-family building (Barcelona - Spain) - Arch. Abaa arquitectes associats S.L.
Public building (Murcia, Spain) - Arch. Raul Torres Rubio
Ventilated façade

The façade is both the image of the building and the envelope that protects it from the elements. Thanks to its special features, the STON-KER® ventilated façade provides buildings with a wide range of technical and aesthetics benefits.

Aesthetics and durability

Colours, formats, stability, resistance, anti-graffiti, hygiene, water-tightness...

PORCELANOSA Grupo is at the forefront in terms of production, research and development and technical innovation in the porcelain tile sector. The group offers hi-tech products with excellent technical and aesthetic qualities, adapted to the needs of designers and architects. Its range of colours, finishes, textures and formats in porcelain tiles is one of the most extensive on the market, and is suitable for cladding ventilated façades in any type of project and application. Special models can be developed based on the requirements, preferences and demands of our clients. The STON-KER® ventilated façade allows designers to present innovative projects and fully satisfy their requirements in terms of quality.

STON-KER® ventilated façade system with visible fixing clips

STON-KER® ventilated façade system with concealed fixing clips

System components:
1. Dry enclosure panel
2. Omega profile
3. Angle bracket
4. T profile
5. Fixing clip
6. STON-KER®

Energy savings and sustainable development

Considerable improvements in the thermal behaviour of the façade, by increasing the thermal resistance of the envelope or overall improvement in the performance of the façade, as well as many other benefits.

- Reduction of the thermal transmission coefficient (U) of the building envelope by increasing the thermal resistance by convection of the outer surface of the envelope.
- Easier installation of the insulation material on the outside of the existing envelope in renovations or new projects.
- Reduction of the heat flow caused by incident solar radiation in summer by up to 80%, thanks to the chimney effect created between the porcelain tile cladding and ventilated air gap. As a result of the air inside the gap heating up and causing low pressure inside the gap with respect to the external pressure, the hot air rises by convection, allowing cooler air from the outside to enter the gap through the open joints. Prevention of direct radiation on the supporting wall and drastic reduction of solar heating through the envelope. This means that the width of the existing air gap must be 1/2" or more between the rear of the tiles and the outer surface of the thermal insulating material.
- Elimination of thermal contacts at points where the edges of the floor slab connect with the vertical envelope, by installing thermal insulating material on the outside of the supporting wall, both in renovation projects or new building projects.
- Greater inertia of building envelope.
- More comfortable conditions inside the building.
- Reduction in heating requirements, and reduction in cooling requirements up to a certain point.
- Energy savings depending on local climate, direction of building and number of doors and windows in the building.
- Reduction in CO₂ emissions thanks to improved energy performance of the building.
- Reduced air noise thanks to the presence of open joints in the whole of the façade and the ventilated air gap.

Energy savings and sustainable development

- Porcelain tiles do not emit volatile organic compounds (VOCs).
- 100% recyclable natural product.

Butech / PORCELANOSA has evaluated the energy efficiency of the STON-KER® ventilated façade thanks to a thermal characterization study carried out by the CIDEMCO Institute. The policy of PORCELANOSA Grupo stands out for its commitment to supply products with the best possible service that fully respond to clients’ expectations and demands, complying with applicable legal and environmental standards. With this aim in mind, PORCELANOSA Grupo has made a commitment to maintain its position of leadership in terms of quality and the compliance of its quality control system with the ISO 9001 standard.

Since it first began its industrial activity, the commitment of PORCELANOSA Grupo towards the preservation and conservation of nature and the environment as a whole has taken shape through ECOTECH, a series of ideas and actions applied to the environment. As a result, major investments have been made on a yearly basis in water supply systems, recycling waste materials, protecting the atmosphere and saving energy, or in certifying the group’s environmental management according to the ISO 14001 standard.

• Wide range of colours, finishes, formats and textures.
• Different layout patterns possible.
• High dimensional stability.
• Savings on space, increase of inhabitable surface.
• High durability of porcelain tiles: resistance to atmospheric agents; resistance to UV rays, which do not alter the appearance of the tiles with time; if necessary, the tiles can be replaced with other identical tiles (with the possibility of reproducing the same colour shades); resistance to thermal shock thanks to a low thermal expansion coefficient.
• Without grouting or sealing materials between the tiles, air gap ventilated through open joints (joint width of ≤ 5/16”).
• Elimination of steam condensation thanks to ventilated air gap and installation of insulation material on the outside of the building envelope.
• Thermal insulation and supporting wall of the building protected from rain thanks to the reduced width of the open joints, the vertical position of the air gap and the solutions used for all of the construction details on the façade (mouldings, protective elements, etc.).
• Adaptable to the architectural style used.
• Resistance to cracks, abrasion, scratching, freeze/thaw cycles and impacts; tiles resistant to different impact classifications (special STON-KER® tiles).
• Minimum maintenance for façade, or not required practically non-existent water absorption (WA < 0.02%); non-porous; highly compact, with apparent density of 149.80 lb/ft³; anti-graffiti; resistant to chemical corrosion (METALIA series, class B); resistance to stains; resistance to microorganisms; hygienic.
• Prevention of problems associated with efflorescence or the appearance of damp on the façade.
Safety, protection and ease of installation

• Mechanical fixing system using visible or concealed clips to prevent the tiles coming loose.
• Structural anchoring system that isolates the façade from movements in the structure of the building, by allowing the two layers to move independently.
• Possibility of creating air gaps of different widths using angle brackets from 1”-3/4” to 14”.
• Possibility of correcting envelope plumbness using a structural anchoring system to compensate for irregular wall sections.
• Fire resistance of glazed porcelain tiles EURO CLASS B-s2, d0 according to the BS EN 13501-1:2002 standard.
• Impact resistance.
• Seismic resistance.
• Installation work causes minimum disturbance.
• Anti-fragmentation grid on the back of the tile.
• Light surround system. Full system weight less than 0,03976 psi.
• Possibility of replacing the tiles independently.
• Complete, fast and simple construction details such as framed VSG, the crowning, etc.

The system has obtained favorable certifications such as the BBA Agreement Certificate 10/4775 in United Kingdom, the Florida Product Approval FL9364 in United States of America, the EMI certificate A-758/2006 in Hungary, ICC certificate in USA, the Spanish certification DIT 530 by the Eduardo Torroja institute or the certificate Avis Technique CSTB n° 02/10-476 in France.

This system, which has now been on the market for 15 years, is increasingly used in both renovation and new construction projects.

Unites States Product Certificacions

FL9364
Florida building code approved

ESR-3343

Sol Costablanca Hotel (Benidorm - Spain) - Arch. Yolanda Llorca
Tiles for ventilated façades

Weights according to STON-KER formats

Other formats available:
12 3/16" x 43 5/16" 13/16" 23 5/16" x 23 5/16" x 6/16" - 19.2 lb/piece · 5 lb/ft²
17 3/4" x 26" x 6/16" - 15.12 lb/piece · 4.84 lb/ft²
12x16/16” x 25 16/64” x 6/16” · 13.76 lb/piece · 4.85 lb/ft²
17/16” x 35 1/8” x 6/16” · 22.86 lb/piece · 5.22 lb/ft²
We offer custom models for areas larger than 3,000 m².
PORCELANOSA Grupo produces its tiles at its factories in Villarreal (Spain), at the PORCELANOSA y de VENIS, plants, certified according to the ISO 9001 and ISO 14001 standards.

The porcelain tiles are dry-pressed, glazed and completely vitrified, as per the BS-EN 14411 standard, with low water absorption – Bia Group (≤ 0.5 %).

All the tiles are provided of an anti-fragmentation mesh on the reverse side Visible and invisible fixing.

When using the invisible fixing system, the tiles have slots cut into them in specific points. The slot has a characteristic tensile strength of 71.8 lbf.

Can be installed vertically or horizontally.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10545-2</td>
<td>Length &amp; width.</td>
<td>Deviation of ± 0.5 % with respect to manufacturing measurement</td>
<td>Meets requirements</td>
<td>Meets requirements</td>
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<tr>
<td></td>
<td>Thickness</td>
<td>Deviation of ± 5 % with respect to manufacturing measurement</td>
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<tr>
<td></td>
<td>Straightness of sides</td>
<td>Deviation of ± 0.5 % with respect to manufacturing measurement</td>
<td>Meets requirements</td>
<td>Meets requirements</td>
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<tr>
<td></td>
<td>Surface flatness</td>
<td>Deviation of ± 0.5 % with respect to manufacturing measurement</td>
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<td>Meets requirements</td>
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<tr>
<td>10545-3</td>
<td>Water absorption</td>
<td>Mean value ≤ 0.5 %</td>
<td>Meets requirements</td>
<td>Meets requirements</td>
</tr>
<tr>
<td>10545-4</td>
<td>Modulus of rupture</td>
<td>≥ 4.3·10³ lbf/in² minimum individual value</td>
<td>≥ 5,79·10³ lbf/in²</td>
<td>≥ 6,8·10³ lbf/in²</td>
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<tr>
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<td>Breaking strength</td>
<td>&gt; 392.35 lbf</td>
<td>&gt; 449.62 lbf</td>
<td>&gt; 449.62 lbf</td>
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<tr>
<td>10545-8</td>
<td>Linear thermal expansion</td>
<td>Test method available</td>
<td>Resistant</td>
<td>Resistant</td>
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<tr>
<td>10545-9</td>
<td>Resistance to thermal shock</td>
<td>Test method available</td>
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<td>Resistant</td>
</tr>
<tr>
<td>10545-11</td>
<td>Resistance to crazing-glazed tiles</td>
<td>Required</td>
<td>Meets requirements</td>
<td>-</td>
</tr>
<tr>
<td>10545-12</td>
<td>Frost resistance</td>
<td>Required</td>
<td>Meets requirements</td>
<td>Meets requirements</td>
</tr>
<tr>
<td>10545-13</td>
<td>Resistance to acids and alkalis</td>
<td>According to manufacturer’s data</td>
<td>GLA-GHA*</td>
<td>Depends on model</td>
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<tr>
<td></td>
<td>Resistance to chemical products for domestic use and pools additives</td>
<td>Minimum Class B</td>
<td>GA</td>
<td>UA</td>
</tr>
<tr>
<td>10545-14</td>
<td>Resistance to staining</td>
<td>Minimum Class 3</td>
<td>Class 5</td>
<td>Depend on model</td>
</tr>
</tbody>
</table>

* Except Metalia series GLB-GHB
Façade renovation

The envelope of a building is the element that provides its image. Renovating a building envelope using a ventilated ceramic façade does not only result in an important change in aesthetic terms, but also improves the energy efficiency of the building. Using STON-KER ceramic material leads to minimum maintenance costs for building façades, providing a highly durable cladding system thanks to its characteristics.

The low absorption properties of STON-KER, combined with an open joint system, prevents the appearance of efflorescence on the façade. In terms of the energy savings that result from this system, by installing insulation material uniformly over the whole façade it is possible to eliminate thermal bridges that appear on the edges of floor slabs and pillars.

Also, thanks to the airflow generated inside the gap, condensation is prevented and the thermal-acoustic insulation material is kept dry, improving its efficiency. In summary, investing in a ventilated façade changes the appearance and functional performance of a building’s outer envelope, making it easy to maintain and very long lasting.

Advantages

1. The three-dimension motion freedom of the system in conjunction with the flexibility of the aluminum used in its manufacturing, allows our Ventilated Facade system to avoid the structural movements of the building to affect directly the finish of the facade.
2. As the ventilated façade system creates an air gap, wiring and other elements can be concealed inside it. The air gap created between the tiles and the structure in our ventilated façade system can be used to conceal wiring and other elements in its interior.
3. The ventilated air gap also helps to solve existing problems affecting the building such as leaks, unventilated areas, noise, deterioration of the thermal insulation, etc. Refurbishments on the old façade can be carried out without aesthetic worries as it will be later covered by the Ventilated Facade. Any moisture that is present dries quickly thanks to the airflow inside the gap due to the chimney effect. This means that the useful life of the façade materials is considerably extended, and that the existing construction systems are not damaged.
4. The Ventilated Façade uses a mixed cladding system, with adhesive and mechanical anchors to ensure that the tiles are fixed firmly in place while direct bonding leads to risks such as incorrect laying or use of the adhesive material.
5. Being a projected façade, the system allows to conceal any shape irregularity in the building that makes the completion of the project much faster than the bonded fixing systems. Irregularities of 3”-15/16” or more between the deepest and highest point of the façade can be absorbed.
6. An especially important aspect is that the ventilated façade can be installed quickly on buildings that are in use, when completion times have to be as short as possible.
7. The ventilated façade system makes it possible to resolve all contact points, details and surrounds quickly and easily, either using ceramic tiling or aluminium.
8. Thanks to the wide range of formats and the possibility of cutting pieces to measure on site, it is easy to find a format that adapts to the shape of the building, reducing waste to a minimum.
9. Porcelain tiles remain unaltered over time by atmospheric agents, are graffiti-proof, do not require maintenance and have an absorption factor of less than 0.02%, making them ideal for this type of use.
10. The porcelain tile ventilated façade is a light envelope solution, as it weighs less than 30 kg/m² (approximately 6 lb/sqft), only placing a small load on the existing building structure.
11. Efflorescence on the façade is prevented thanks to the open joint between the sections, and the low absorption of the porcelain tiles.
French building federation ( Tours - France)
Claridge Hotel (Madrid - Spain)

Cultural center (Torreblanca - Spain)
Public building (Utiel - Spain)

Single-family building (Santander - Spain)
Indigo Hotel (Newark, New Jersey - USA)
Ventilated façade technical details

1. Secondary aluminum bracket.
2. Aluminum vertical "T" profile.
3. Thermal insulation.
4. STON-KER porcelain tile.
5. Brick.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.

Invisible fixing system

1. Secondary aluminum bracket.
2. Aluminum vertical "T" profile.
3. Thermal insulation.
4. STON-KER porcelain tile.
5. Brick.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.

Corner section

1. Secondary aluminum bracket.
2. Vertical "T" aluminum profile.
3. Thermal insulation.
4. STON-KER porcelain tile.
5. Brick.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.
10. Aluminum angle.

Horizontal section

1. Secondary aluminum bracket.
2. Aluminum vertical "T" profile.
3. Thermal insulation.
4. STON-KER porcelain tile.
5. Brick.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.
Window with STON-KER frames
1. Secondary aluminum bracket.
2. Aluminum vertical "T" profile.
3. Thermal insulation.
4. STON-KER porcelain tile.
5. Wall.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.
10. Aluminum gutter.

Window of external sides
1. Secondary aluminum bracket.
2. Aluminum vertical "T" profile.
3. Thermal insulation.
4. STON-KER porcelain tile.
5. Brick.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.
10. Aluminum angle.
1. Secondary aluminum bracket.
2. Aluminum vertical "T" profile.
3. Thermal insulation.
4. STON-KER porcelain tile.
5. Wall.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.
10. Aluminum angle.
11. Aluminum head jamb.
1. Secondary aluminum bracket.
3. Omega profile.
4. STON-KER porcelain tile.
6. Concealed fixing clip.
7. K5.5 x 22 screw A2 stainless steel.
8. 4.2 x 12 screw A2 stainless steel.

GWB-2. Exterior glass mat gypsum sheathing.
AB-1. Fluid-applied membrane vapor-retarded air barrier.
MF-1. Cold formed metal framing.
INS-7. Black foam board insulation.
The large size of this type of porcelain tile, its zero water absorption, its resistance to atmospheric agents, its lightness with less than 10.5 kg/m² as well as its design, make the XLIGHT slabs an excellent solution for all types of facades.

**Features:**
- Thickness ISO 10545-2: 9/64 ± 5% in
- Surface flatness ISO 10545-2: 0.1 %
- Water absorption ISO 10545-3: < 0.1 %
- Flexural strength ISO 10545-5: > 17.4 · 10³ lbf/in²

**Metal substructure.**

Load-bearing substructure of the ventilated facade, as per DIT 530/11. It is made up of the following elements:

- **Aluminum separators** for transmitting loads from the substructure to the supporting wall through anchors. Available from 2-23/64 “ to 6-19/64” in length. Depending on the type of stress they bear, there are two types of anchors: primary and secondary.
- **Vertical substructure of aluminum sections** for installing XLIGHT slabs. Available in T-shaped sections (3-15/16" width) or L-shaped sections (1-37/64" width).

**Features:**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength (Rm)</td>
<td>≥ 39.16 · 10³ lbf/in²</td>
</tr>
<tr>
<td>Yield strength (Rp 0.2)</td>
<td>≥ 32.63 · 10³ lbf/in²</td>
</tr>
<tr>
<td>Elongation (A)</td>
<td>≥8 %</td>
</tr>
<tr>
<td>Brinell Hardness</td>
<td>90</td>
</tr>
</tbody>
</table>

**Mechanical anchors.**

Clips for mechanical anchoring, as per DIT 530/11 design. Manufactured in AISI 304 stainless steel and 3/64” (± 15%) general thickness, they can be supplied lacquered in the RAL color that the customer needs. There is a wide range of different clips available, which adapt to all facade anchoring needs.

**Features:**

- Tensile strength (Rm): 23.7 · 10² - 10.8 · 10³ lbf/in²
- Elongation (A): ≤ 45% 
- Brinell Hardness: 183

**XLight Tools**

Handling, cutting, and installation of XLIGHT ceramic requires special tools. These tools are designed for pieces with a format of up to 118-7/64” x 39-3/8” and thickness of Little more than 1/8”. The essential tools for installing XLIGHT ceramic are the following:

- **XLIGHT Frame / carrier.** Aluminum structure of up to 118-7/64” long, equipped with suction cups for moving large format pieces.
- **Cutting guide plus XLIGHT pincers.** Tool for cutting XLIGHT ceramic straight, plus pincers for separating marked pieces. It includes diamond point.
- **Notched trowel and XLIGHT rubber trowel.** Notched trowel with 25/64” sloped serrations which facilitates uniform spreading of the adhesive, plus rubber trowel for pressing XLIGHT ceramic on adhesive.

**Self-leveling spacers.**

Spacers are essential when installing quality ceramic; they make work easier and ensure uniform width joints. There are self-leveling spacers currently available that facilitate the leveling of the wall covering and avoid ledges between tiles. A special tab has been designed for installing XLIGHT slabs that protects and facilitates the assembly, even with 9/64” thick slabs.

The substructure’s anchoring system depends on the type of substrate used in the project. The site management and the installing company shall be in charge of this.

**Anchoring system**

- **Mechanical anchors.**
- **Polyurethane adhesive.** It polymerizes in contact with environmental moisture, forming an extraordinarily elastic and adhesive elastomer. Specially recommended for bonding ceramic on metal sections. Indoor and outdoor use

**Features:**

- Type B-1 as per UNE 53622
- High adherence and elasticity
- Resistant to UV-rays and frost
Weights according XLight formats

- 39\(\times\) 118\(\times\) 1/8\(\prime\) - 52.91 lb/piece · 1.64 lb/ft²
- 39\(\times\) 39\(\times\) 1/8\(\prime\) - 17.63 lb/piece · 1.64 lb/ft²
Ventilated façade & XLight technical details

Invisible fixing system

Vertical section

1. Secondary aluminum bracket.
3. Thermal insulation.
4. XLight porcelain tile.
5. Brick.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.

Window of internal sides with XLight frames

1. Secondary aluminum bracket.
3. Thermal insulation.
4. XLight porcelain tile.
5. Wall.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.
1. Secondary aluminum bracket.
2. Aluminum vertical "T" profile.
3. Thermal insulation.
4. XLight porcelain tile.
5. Wall.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.
10. Waterproofing sheet.

Window of internal sides with aluminum frames

1. Secondary aluminum bracket.
2. Aluminum vertical "T" profile.
3. Thermal insulation.
4. XLight porcelain tile.
5. Wall.
7. Stainless steel self-drilling screw.
8. Mechanical anchor.
10. Aluminum coating.
Ventilated façade & KRION®
Tour Raffinity (Casablanca - Marocco) - Arch. Hembert Peharanda
3. Thermal insulation.
4. KRION.
5. Wall.
6. KRION cap.
7. SN5 self-drilling screw.
8. Mechanical anchor.

3. Thermal insulation.
4. KRION.
5. Wall.
6. KRION cap.
7. SN5 self-drilling screw.
8. Mechanical anchor.

1. “U” section bracket.
2. Horizontal profile.
3. Aluminium flashing.
4. Anchor plate.
5. KRION plate.
6. Cantilevered beam for glass fixing.
7. KRION.
8. Glass.
9. Connector between glass and KRION.

Tour Raffinity (Casablanca - Marocco) - Arch. Hembert Peñaranda
Showroom Bershka (Madrid - Spain) - Arch. Castelveciana arquitectos
1. Aluminum vertical "T" profile.
2. Secondary aluminum "L" bracket.
3. Thermal insulation
4. KRION.
5. Wall.
6. KRION cap.
7. SN5 self-drilling screw.
8. Mechanical anchor.

3M Offices (Madrid - Spain)

Photography: Rafael Navarro
Window returns

1. Aluminum vertical "T" profile.
2. Secondary aluminum "L" bracket.
3. Thermal insulation.
4. KRION.
5. Wall.
6. KRION cap.
7. SNS self-drilling screw.
8. Mechanical anchor.
1. Aluminum vertical "T" profile.
2. Secondary aluminum "L" bracket.
3. Thermal insulation
4. KRION.
5. Wall.
6. KNION cap.
7. SNS self-drilling screw.
8. Mechanical anchor.
Ventilated façade & KRION Lux

KRION® is a product that is solid, compact, pore-free, with uniform properties throughout its section, and which can be transformed to obtain figures and complex volumes. The KRION® surfaces employed by butech / PORCELANOSA have high resistance to temperatures and chemical agents, are easy to clean and maintain, and offer warmth and beauty, making these solid surfaces ideal for the most demanding applications.

Unlike other materials used professionally, it can be injected, cut, machined, and glued, achieving invisible joints. This property allows the most demanding applications.

Features
KRION® is a new generation solid surface developed by SystemPool, a company from the PORCELANOSA Group. It is a product that is warm and velvety to the touch, similar to natural stone, solid, with a uniform mass, non-porous, available both in slabs and in molded figures, and that allows for an invisible joint between the different pieces.

This product is also hygienic, unrevealing, non-toxic, virtually fireproof, easy to maintain and repair, it has multiple transforming possibilities, and a high resistance to chemical agents, water vapor, or the weather.

Advantages
- Anti-graffiti.
- Fire-resistant.
- Resistant to cigarette burns.
- Eco-friendly.
- Antibacterial (no additives).
- Great durability.
- Resistant to high temperature.
- High degree of hardness and mechanical strength.
- Moldable.
- Large surfaces without joints.

Maintenance
In order for the material to regain its initial state, butech / PORCELANOSA recommends to strictly follow the manufacturer recommendations for cleaning tough stains, which are to rub the surface using a green fiber Scotch-Brite® scouring pad. This way the tough stains will disappear, so that any cleaning team will be able to carry out these maintenance tasks without needing to resort to more sophisticated items or special cleaning agents.

It can be entirely restored, which means that it can return to its original appearance. Even cigarette burns can be removed with a normal detergent and a scouring sponge.

KRION Lux colours
KRION is very stable against UV damage. However, any alteration (rapid or slow, appreciable or not) is dependent on the chemical composition of the different additives required to produce the final colors.

Therefore, due to inevitable superficial deterioration, a slight change of shade will be noticeable after some years. Changes in shade are measured in ΔE units by comparing L, a, b values, where values lower than 8 show a barely perceptible difference.

Time equivalence results for artificial ageing are not empirical, but can be correlated with results obtained by natural ageing over a 10 year period in an equivalent project.

There are several formulas for calculating delta-E (ΔE), CIE76 being the most common and easy to use.

$$\Delta E^* = \left( \left( L_1 - L_2 \right)^2 + \left( a_1 - a_2 \right)^2 + \left( b_1 - b_2 \right)^2 \right)^{1/2}$$

- **SUPREME**: optimum performance in exterior use. Color variation over a 10 year period is less than $\Delta E = 3$. The best choice for outdoor areas.
- **EXCELLENT**: good performance in exterior use. Color variation over a 10 year period is less than $\Delta E = 5$. Good choice for outdoor areas.
- **GOOD**: acceptable performance in exterior use. Color variation over a 10 year period is less than $\Delta E = 15$. Acceptable choice if a slight color variation is acceptable.
- **NORMAL**: least recommended for external use since color variation over a 10 year period is greater than $\Delta E = 15$. Suitable choice if a change in color is not important.

<table>
<thead>
<tr>
<th>Supreme</th>
<th>Excellent</th>
<th>Good</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100 Snow White</td>
<td>1105 Ice</td>
<td>1101 Ice</td>
<td>1141 CrystalWhite</td>
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<tr>
<td>1150 Pearl</td>
<td>1504 Soap</td>
<td>1501 Soap</td>
<td>1141 CrystalWhite</td>
</tr>
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<td>1503 Lady</td>
<td>1504 StoneWhite</td>
<td>1501 StoneWhite</td>
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</tr>
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<td>1408 Chrysophr</td>
<td>1401 Strawber</td>
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</tbody>
</table>
Properties

**Anti-graffiti**
Graffiti can be completely removed after they have been made on the surface, and regardless of the time passed since they are made, by using a Scotch-Brite® type scouring sponge.

**Fire resistance.**
Fire-resistance rating is B-s1, d0 according to the UNE-EN 13501-1:2002 standard; this classification corresponds to Flame retardant material. (It is equivalent to classification M1 according to UNE 23727-1990 standards).

Considering the Spanish Technical Building Code (CTE), the Euroclassifications A1, A2, and B, correspond to the non-combustible and low combustibility product classes. They represent those construction products which are safer in terms of fire safety.

Documentation: Tests from the Technical Fire Center 1010100-01 Cl.

**Cigarette burn resistance.**
Cigarettes are consumed 25/64”, and are then deposited on the material with 25/32’’ more are burned up. They are then removed, and the stain they leave is perfectly removed using a scouring sponge.


**Resistance to solar radiation.**
The temporal equivalence of artificial aging results is not empirical, although correlations can be established between this study and the results obtained from 10 years of natural aging in the area of Valencia.

Artificial aging tests consisting of a total of 12 extreme exposure alternate cycles, for a continuous period of 2016 hours, produce the following color material modification:

- **fv KRION® Pure Lux**
  Color variation: ΔΕ = 0.55
  This value corresponds to a variation that is very slight and practically unrecognizable to the human eye.

- **fv KRION® Stone**
  Color variation: ΔΕ = 5.24
  This value corresponds to a moderate color change and is only superficial, affecting 10 surface microns that can be removed using a Scotch-Brite® type scouring sponge, thus recovering the original color.

Therefore, material aging in the long run is minor, and it is possible to recover the initial appearance with basic maintenance.

Documentation: AIDIMA Report 1001022-03/04/05; QuV Chamber Tests.

**Permeability to water.**
The water absorption that KRION® has under different unfavorable conditions, such as water vapor application, immersion in boiling water, or permanent placement in water without aeration, stays in peak values of 0.15 %, desorbing all of the water after the immersion.

This extremely low absorption level guarantees the non-existence of problems related with material hydrolysis.


**Resistance to thermal shock.**
It passes the shock tests, which consist of 1,000 cycles of 30 seconds each, alternating water at 90 °C with water at 15 °C.

This property reduces the chances of cracking from sudden temperature changes.

Documentation: AIMPLAS Tests in accordance with ISO 19712.

**Resistant to both microbial and fungal attack and proliferation.**
KRION® complies with the most demanding hygienic-sanitary regulations, and is suitable for high requirement applications such as clean rooms or operating rooms.

This property, as well as its non-corrosiveness, ensures the material's high durability.


**Backlighting.**
KRION® Pure Lux allows the creation of back-lit atmospheres. Spectacular lighting effects can be achieved by combining different material thicknesses.


**Technical features**

<table>
<thead>
<tr>
<th>Property</th>
<th>Method</th>
<th>Units</th>
<th>Results</th>
<th>Results</th>
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<tbody>
<tr>
<td>Mineral modulus</td>
<td>EN ISO 178</td>
<td>psi</td>
<td>1.4210³ - 1.4110³</td>
<td>1.2410³ - 1.2610³</td>
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<tr>
<td>Elongation</td>
<td>EN ISO 178</td>
<td>%</td>
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<td>0.06 - 0.12</td>
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<td>Compression resistance</td>
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<td>psi</td>
<td>1.6010³ - 1.6610³</td>
<td>1.5010³ - 1.4610³</td>
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<td>Impact resistance (continuous load)</td>
<td>DIN ISO 4586 T11</td>
<td>Bf</td>
<td>&gt; 5 52</td>
<td>&gt; 6 62</td>
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<td>Impact resistance (falling ball)</td>
<td>ISO 19712</td>
<td>Ball 1107 lb/in²</td>
<td>Does NOT break (&gt;147-1/4&quot;)</td>
<td>Does NOT break (&gt;147-1/4&quot;)</td>
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<td>Surface hardness (Mohs scale)</td>
<td>DIN EN 101</td>
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<td>3</td>
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<td>Abrasion resistance (use)</td>
<td>DIN ISO 4586 T6</td>
<td>% mass / 100 rev</td>
<td>0.148</td>
<td>0.11</td>
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<td>Immersion in boiling water</td>
<td>DIN ISO 4586 T7</td>
<td>Height %</td>
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<td>Resistance to bacteria and fungi</td>
<td>DIN EN ISO 846</td>
<td>Do NOT thrive</td>
<td>Do NOT thrive</td>
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<td>Dimensional stability 20 °C</td>
<td>DIN ISO 4586 T10</td>
<td>% change in length</td>
<td>0.01 (50% HR and 23% HR)</td>
<td>0.02 (50% HR) and 0.08 (23% HR)</td>
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<td>Resistance to dry heat 100 °C</td>
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<td>Slight change brightness/color</td>
<td>Slight change brightness/color</td>
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<td>Translucency (onion arc)</td>
<td>DIN ISO 4586 T16</td>
<td>“Blue wool”</td>
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<td>Non-slip properties</td>
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<td>Less than 120 sanding</td>
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<td>CLASS 2</td>
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<td>Rd (roughness)</td>
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<td>45 CLASS 2 (hurried and greedy areas)</td>
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<td>19 CLASS 1 (interior humid areas)</td>
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<td>180-Sanded fresh anti-slip properties</td>
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<td>Surface resistivity</td>
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<td>Toxicity of combustion gases</td>
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<td>Euroclass B, x1, d0</td>
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<td>Flame spread</td>
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<td>Smoke developed</td>
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<td>Resistance to thermal shock (50 - 30 °C)</td>
<td>ISO 19712-2 (Univ)</td>
<td>250 Cycles</td>
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<td>Resistance to thermal shock (60 - 10 °C)</td>
<td>ISO 19712-3 (Shape)</td>
<td>500 Cycles</td>
<td>Satisfactory</td>
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</table>
Cutting and pasting

Chemical welding.
In first place, we must prepare the chemical welding kit. Once prepared, we shall join the slabs in a seam, so that the welding kit paste joins the two pieces. After joining the pieces, let dry.

Gluing.
Whenever we want to join edges, these should be straight or at 90° angles. Before applying the adhesive, the area should be cleaned with a cloth and methylated spirit; this way we will leave the area 100% clean. In order to achieve invisible joints, the use of KRION® adhesive is essential.

Linear cutting.
If we want to make linear cuts, we shall use a circular saw with hardened metal or diamond teeth.

Curved cut.
If we want to make linear cuts, we shall use a circular saw with hardened metal or diamond teeth.

Polishing and finishing

Pulido.
A random orbital sander must be used, with movements from top to bottom or from left to right.

Finishing.
The finishing, whether it is glossy or matt, can be done at the end of the work with sandpaper. This finishing can be chosen by the customer.

You can request more information at sistemas@butech.es

Assembly and installation

Place the butech aluminum profiles.

Once the butech aluminium profiles are placed, perfectly aligned and plumbed, the slabs are then screwed on. The slabs have inserts that house inside them the KRION® aluminium clamps, which guarantee a correct fastening.

After cleaning and drying the surface on which we are going to perform the chemical welding with the next slab, a continuous seam of KRION® liquid adhesive is applied inside the female part of the slab.

After 24 hours, the surface sanding may be carried out, eliminating all the rugosities, stains, and excess adhesive, obtaining the final finishing of the KRION® slabs.

The fastening clips are installed so they exert pressure and ensure a perfect joining of the two slabs.

After this, remove the clips and wood wedges.

Next, we glue the insert plugs with KRION® adhesive, so that it overflows. In order to glue these plugs, they must be clean and dry.

Next, the male part of the next slab is inserted into the female part, so that the KRION® adhesive overflows.

Afterwards, we must stick wooden wedges every 6" for installing clips to apply pressure between slabs.

Image of prepared KRION® slabs with adhesive.

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KRONO® vf Façade System certificates and tests

Test list:
- Resistance tests to wind effects: report of CSTB tests no. CLC 12-26037368 of 07/03/2012.
- Resistance tests to wind effects after fatigue: report of CSTB tests no. CLC 12-26037925 of 14/03/2012.
- Insert pull-out resistance tests, flexural and tensile strength tests on the welded joints, in the initial state and after aging and heat + humidity: report of CSTB tests no. CLC 12-26037398/26037404 of 03/08/2012.
- Insert pull-out resistance tests, flexural and tensile strength tests on the welded joints, after ice / thaw cycles: report of CSTB tests no. CLC 12-26037400/26037404 of 03/08/2012.
- Reaction to fire tests: PV number 1010100-01CL and 1010122-01CL, carried out at the Institute AIDICO Technical Fire Center, in Spain.

Done at the AIDICO Institute Technical Center Fire in Spain.
Cladding substructure
**Cladding structure**

Aluminium vertical profiles EN AW 6005 T6 7/64" thick, fixed over L-shaped brackets to allow structural movements. Maximum gap between vertical profiles 47-1/4".

<table>
<thead>
<tr>
<th>KEA</th>
<th>SAP</th>
<th>DESCRIPTION</th>
<th>WEIGHT (kg/unit)</th>
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<tr>
<td>100004395</td>
<td>B80400023</td>
<td>Aluminium T-profile 10x65x2.7 ml (3/16''/2''/18&quot;) black</td>
<td>0.04 (0.088 lb/unit)</td>
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<tr>
<td>100006236</td>
<td>B80400103</td>
<td>L-profile 40x60x2.5mm (3/16''/2''/18&quot;) black</td>
<td>0.04 (0.088 lb/unit)</td>
</tr>
<tr>
<td>100014531</td>
<td>B80400370</td>
<td>PV 80x60x2.5mm (3/16''/2''/16&quot;) 3m long aluminium tubular profile</td>
<td>0.006 (0.013 lb/unit)</td>
</tr>
<tr>
<td>100111024</td>
<td>B80400460</td>
<td>PV omega profile alu. 20x140x3000 mm (5/32''x5/16''x118&quot;)</td>
<td>0.006 (0.013 lb/unit)</td>
</tr>
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<td>100006229</td>
<td>B80400105</td>
<td>Single aluminium angle bracket. length 60 mm (2'')</td>
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<td>B80400108</td>
<td>Single aluminium angle bracket. length 100 mm (3'')</td>
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<td>B80400110</td>
<td>Single aluminium angle bracket. length 120 mm (4'')</td>
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<td>B80400112</td>
<td>Single aluminium angle bracket. length 140 mm (5'')</td>
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<td>B80400114</td>
<td>Single aluminium angle bracket. length 150 mm (6'')</td>
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<td>Single aluminium angle bracket. length 175 mm (8'')</td>
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<td>B80400120</td>
<td>Single aluminium angle bracket. length 200 mm (10')</td>
<td>0.003 (0.006 lb/unit)</td>
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<tr>
<td>100006228</td>
<td>B80400124</td>
<td>Double-aluminium angle bracket. length 60 mm (2'')</td>
<td>0.010 (0.021 lb/unit)</td>
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<tr>
<td>100006230</td>
<td>B80400126</td>
<td>Double-aluminium angle bracket. length 80 mm (3'')</td>
<td>0.015 (0.034 lb/unit)</td>
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<tr>
<td>100006234</td>
<td>B80400128</td>
<td>Double-aluminium angle bracket. length 100 mm (4'')</td>
<td>0.020 (0.043 lb/unit)</td>
</tr>
<tr>
<td>100006232</td>
<td>B80400130</td>
<td>Double-aluminium angle bracket. length 120 mm (5'')</td>
<td>0.025 (0.054 lb/unit)</td>
</tr>
<tr>
<td>100006235</td>
<td>B80400132</td>
<td>Double-aluminium angle bracket. length 140 mm (6'')</td>
<td>0.030 (0.065 lb/unit)</td>
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<tr>
<td>100006237</td>
<td>B80400134</td>
<td>Double-aluminium angle bracket. length 150 mm (8'')</td>
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<tr>
<td>100006105</td>
<td>B80400136</td>
<td>Double-aluminium angle bracket. length 175 mm (10')</td>
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<tr>
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<td>B80400140</td>
<td>Double-aluminium angle bracket. length 200 mm (10')</td>
<td>0.045 (0.097 lb/unit)</td>
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<tr>
<td>100006222</td>
<td>B80400144</td>
<td>Invisible central stainless steel fixing clip, 5 mm (3/16&quot;) of joint</td>
<td>0.04 (0.088 lb/unit)</td>
</tr>
<tr>
<td>100006222</td>
<td>B80400145</td>
<td>Invisible central stainless steel fixing clip, 8 mm (5/16&quot;) of joint</td>
<td>0.04 (0.088 lb/unit)</td>
</tr>
<tr>
<td>100006230</td>
<td>B80400146</td>
<td>Invisible side stainless steel fixing clip, 5 mm (3/16&quot;) of joint</td>
<td>0.04 (0.088 lb/unit)</td>
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<tr>
<td>100006238</td>
<td>B80400147</td>
<td>Invisible side stainless steel fixing clip, 8 mm (5/16&quot;) of joint</td>
<td>0.04 (0.088 lb/unit)</td>
</tr>
<tr>
<td>100006222</td>
<td>B80400148</td>
<td>Invisible start/end fixing clip</td>
<td>0.04 (0.088 lb/unit)</td>
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**KEA**

100044387
100044390
100044388
100044391
100044389
100069418
100066418
100065262
100066260
100066267
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100011026
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100044394
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100006105
100006132
100006222
100006230
100006238
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100006230
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100006222
100006230
100006238
VF-Stone system
butech / PORCELANOSA and L’ANTIC COLONIAL show their most exclusive ventilated façade system, VF-STONE. A ventilated façade clad in natural stone offers a touch of distinction and natural warmth that other materials simply cannot achieve.

These types of stone - granite, marble, slate etc - have been used by man throughout history to adorn their finest architecture. They are exclusive products, conceived to stand out from all the rest.

Stone-clad ventilated façades offer all the advantages of natural stone, combined with reduced production and installation costs. They also offer all the benefits of a ventilated façade: energy efficiency, insulating the building from cold in winter, thanks to the air cavity between the façade and building; sound insulation; insulation from damp; and savings on maintenance costs.

Added to all this, stone is a timeless material. Natural materials benefit from the fact that they never become out of date. A stone-clad ventilated façade lasts a lifetime.

Exclusive VF-Stone finishes
Mechanical properties

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Rm (lb/in²)</th>
<th>Rp-0.2 (lb/in²)</th>
<th>A50%</th>
<th>HB</th>
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<tbody>
<tr>
<td>Vertical profile</td>
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<tr>
<td>Load bearing and support brackets</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Clip</td>
<td></td>
<td></td>
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<tr>
<td>Retaining spring for clip</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Connecting screws for concrete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connecting screws for masonry</td>
<td></td>
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Maximum permitted load (lb)

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<th></th>
<th>Load bearing bracket</th>
<th>Double clip</th>
<th>Single clip</th>
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<tbody>
<tr>
<td></td>
<td>273.196</td>
<td>132.276</td>
<td>88.184</td>
</tr>
</tbody>
</table>

VF-STONE's system of profiles has been designed to meet all the necessary mechanical and anti-corrosion building requirements. This system of profiles can be installed on a solid, perforated or hollow support and it can be adjusted vertically and horizontally, thus complying with standard UNE 41957.

Its system of profiles is made up of vertical profiles, load-bearing brackets, support brackets and clips to hold the stone in place. The clips can be concealed or visible. Visible ones are used for foliated materials like slate.
Bonded façade
Single-family building (Valencia - Spain)
Offices building (Puerto de Santa María - Spain) - Arch. Ricardo Morales Blanco

Public building (Madrid - Spain) - Arch. Berna Díez
Single-family building (Castellón - Spain)
Arch. Carlos Ferrater and José Luis Gimeno
Bonded façade

Ston-Ker bonded façades merge the beauty of a high-quality porcelain tile finish with other important aspects such as its lightweight, superior resistance to chemical and atmospheric agents, innovative design, and durability.

The Ston-Ker bonded façade system, which has already made its mark as an exterior cladding system, looks set to revolutionize façades for a long time in the future.

Advantages

The Ston-Ker bonded façade system offers the following advantages over other bonded façade systems:

- Greater resistance to damp
- Greater resistance to atmospheric agents
- Greater resistance to water
- Greater versatility in terms of tile size and arrangements
- No colour loss on façade
- Lightweight structure
- Minimum maintenance
- Anti-graffiti and self-cleaning properties.

Concealed fixings bonded façade

Innovative concealed fixing clip for porcelain tiles in bonded facades. The fixings fit within small slots done on the porcelain piece and are anchored to the support by a stainless steel screw. Once the joints are grouted, the fixings are not visible anymore, not affecting the façade design.

butech / PORCELANOSA façade fixings have been designed as a security element in porcelain tile walls installed by the thin layer, double bonding method. We recommend the use of type C2 S2 cementitious adhesives as per EN 12004.

As a general rule, we recommend this kind of fixing from a height corresponding to first concrete slab. In any case, standards in force must be observed for every project.

Visible fixings bonded façade

Visible fixing clip for porcelain tiles in bonded facades. Fixings hold the porcelain tiles and are anchored to the support by a stainless steel screw. Once the joints are grouted, the fixings are visible, and a 13/64” clip can be seen.

butech / PORCELANOSA façade fixings have been designed as a security element in porcelain tile walls installed by the thin layer, double bonding method. We recommend the use of type C2 S2 cementitious adhesives as per EN 12004.

As a general rule, we recommend this kind of fixing from a height corresponding to first concrete slab. In any case, standards in force must be observed for every project.
Technical details

Close-up of finish with flashing
1. Ston-Ker
2. fr-one adhesive
2.1. unilax
3. Mortar screw
4. Anchor bolt
5. Stainless steel screw
6. Minimum joint stainless steel clip
7. GROUT (colorstuk)
8. 4-23/32” brick substrate
9. Thermal/acoustic insulation
10. Air cavity
11. Smooth plaster finish
12. 2-3/4” brick substrate
13. p-404 polyurethane

Close-up of ceramic finish
1. Ston-Ker
2. fr-one adhesive
2.1. unilax
3. Mortar screw
4. Anchor bolt
5. Stainless steel screw
6. Minimum joint stainless steel clip
7. GROUT (colorstuk)
8. 4-23/32” brick substrate
9. Thermal/acoustic insulation
10. Plastic facing
11. Air cavity
12. 2-3/4” brick substrate
13. Smooth plaster finish
14. p-404 polyurethane

Close-up of top finish
1. Ston-Ker
2. fr-one adhesive + unilax adhesive
2.1. unilax
3. Central stainless steel clip
4. Stainless steel screw
5. Anchor bolt
6. GROUT (colorstuk rapid)
7. Mortar screw
8. 4-23/32” brick substrate
9. Thermal/acoustic insulation
10. Plastic facing
11. Air cavity
12. 2-3/4” brick substrate
13. Smooth mortar finish
14. Floor slab
15. Stainless steel start/end clip
16. p-404 polyurethane

Close-up of vertical cross-section of wall
1. Ston-Ker
2. fr-one adhesive
2.1. unilax
3. Mortar screw
4. Anchor bolt
5. Stainless steel screw
6. Minimum joint stainless steel clip
7. GROUT (colorstuk)
8. 4-23/32” brick substrate
9. Thermal/acoustic insulation
10. Air cavity
11. 2-3/4” brick substrate
12. Smooth plaster finish
### System elements

<table>
<thead>
<tr>
<th>KEA</th>
<th>SAF</th>
<th>DESCRIPTION</th>
<th>WEIGHT (kg/ud.)</th>
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<tr>
<td>B8011001</td>
<td>100005743</td>
<td>Concealed fixing. Minimum joint I</td>
<td>0.008 (0.017 lb)</td>
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<tr>
<td>B8011002</td>
<td>100005744</td>
<td>Concealed fixing. Minimum joint A/T 4 cm (1-37/64&quot;)</td>
<td>0.007 (0.015 lb)</td>
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<tr>
<td>B8011003</td>
<td>100005745</td>
<td>Concealed fixing. Minimum joint A/T 8 cm (3-5/32&quot;)</td>
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<tr>
<td>B80201001</td>
<td>100005746</td>
<td>Concealed fixing. Minimum joint A/T 16 cm (6-19/64&quot;)</td>
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</tr>
<tr>
<td>B80107010</td>
<td>100005737</td>
<td>Stainless fixing clip. Ref. 1000</td>
<td>0.011 (0.024 lb)</td>
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<td>B80107011</td>
<td>100005738</td>
<td>Stainless fixing clip. Ref. 1100</td>
<td>0.042 (0.092 lb)</td>
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<td>100008057</td>
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<td>B80400006</td>
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<tr>
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<td>100008060</td>
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**Installation system**

Installation of bonded façade system (minimum joint of 13/64")
Finished projects
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<tr>
<th>Project</th>
<th>ft²</th>
<th>City</th>
<th>Country</th>
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<td>2.24·10²</td>
<td>ZARAGOZA</td>
<td>SPAIN</td>
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<tr>
<td>FV/EDIFICIO DE HACIENDA</td>
<td>2.18·10²</td>
<td>BADAJEZ</td>
<td>SPAIN</td>
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<tr>
<td>FV/ESTEL</td>
<td>2.18·10²</td>
<td>LUHANDE</td>
<td>ANGOLA</td>
</tr>
<tr>
<td>FV/SUBANCA TURKEY</td>
<td>2.15·10²</td>
<td>ISTANBUL</td>
<td>TURKEY</td>
</tr>
<tr>
<td>FV/CENTRO DE DIA</td>
<td>2.15·10²</td>
<td>VILLAR CASTELLIEN</td>
<td>SPAIN</td>
</tr>
<tr>
<td>FV/HOTEL S/OL COSTUBLANCA</td>
<td>2.15·10²</td>
<td>BIDNORM</td>
<td>FRANCE</td>
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<tr>
<td>FV/PLANTAS BAJAS COLEGIO MAYOR MENDIEL</td>
<td>2.15·10²</td>
<td>MADRID</td>
<td>SPAIN</td>
</tr>
<tr>
<td>FV/LA LLORAL</td>
<td>2.15·10²</td>
<td>LA LLORAL</td>
<td>SPAIN</td>
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<tr>
<td>FV/CUB</td>
<td>2.15·10²</td>
<td>BORDEAUX</td>
<td>FRANCE</td>
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<td>FV/24 VIVIENDAS</td>
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<td>SANTANDER</td>
<td>SPAIN</td>
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<tr>
<td>FV/PAU COSTA ARENS DE MAR</td>
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<td>ARENS DE MAR</td>
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<tr>
<td>FV/POBRA DE VALLBONA</td>
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<td>POBLA DEL VALL BONA</td>
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<tr>
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<td>SPAIN</td>
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<tr>
<td>FV/SIENA</td>
<td>1.80·10²</td>
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<td>ITALY</td>
</tr>
<tr>
<td>FV/RIE CHAPPE</td>
<td>1.77·10²</td>
<td>PARIS</td>
<td>FRANCE</td>
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<td>FV/EDIFICIO VIVIENDA HONDA SUR</td>
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<td>FV/CENTRO DIA CERVO</td>
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<td>FV/CENTRO DE SALUD</td>
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<td>ANTEQUERA</td>
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<td>FV/RAJAN</td>
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<td>SAN FERNANDO DE HENARES</td>
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How to get a budget of a PORCELANOSA façade system?

Visit your nearest PORCELANOSA showroom or contact us at info@porcelanosa-usa.com and our technical consultants will be delighted to advise you on the best choice according to your budget, aesthetic preferences and needs. If you need a better understanding on the system, the process and lead times you can also solicit an appointment at your office where our specialized consultants will deepen into the system.

Technical AIA credited CEU presentations for façades are available at your convenience, please visit our website www.porcelanosa-usa.com for more details.

You can also arrange for one of our specialized consultants to visit your offices.
### USA Showrooms

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<th>Location</th>
<th>City</th>
<th>Telephone</th>
<th>Fax</th>
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<tr>
<td>PORCELANOSA ANAHEIM</td>
<td>Anaheim</td>
<td>+1 714 772 3183</td>
<td>+1 714 772 9851</td>
</tr>
<tr>
<td>PORCELANOSA SAN FRANCISCO</td>
<td>San Francisco</td>
<td>+1 415 593 7763</td>
<td>+1 415 593 7664</td>
</tr>
<tr>
<td>PORCELANOSA SAN JOSE</td>
<td>San Jose</td>
<td>+1 408 467 9400</td>
<td>+1 408 467 9410</td>
</tr>
<tr>
<td>PORCELANOSA WEST HOLLYWOOD</td>
<td>West Hollywood</td>
<td>+1 310 300 2090</td>
<td>+1 310 300 2095</td>
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