Raised access floors
technical solutions
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Raised access flooring

Raised access flooring (RAF) was created in response to the need to hide large volumes of cables, pipework, tubing, etc. that are typically found in offices, technical rooms, and other locations. The installation of a raised floor creates a space under the floor where all these services, including equipment and room cooling systems, can be neatly housed and hidden away.

System application areas

Facilities with a high volume of services or in rooms that house technical equipment that requires special ventilation. Commercial applications: offices, libraries, museums, schools, shopping centres, etc. Technical applications: telecommunications/electricity plants, control rooms, laboratories, data centres, etc.

Advantages

- Ability to hide away all types of ugly and dangerous cables, pipes etc. under the floor.
- Improved installation efficiency in comparison to conventional floors (installation rate of about 40 m²/day).
- Easy to take with you when relocating offices.
- Option of rerouting services following installation of floor.

Advantages over other raised access floor systems

- Able to withstand a high mechanical load.
- The potential for combining different structures, as required in each particular case.
- A high-resistance to fire under laboratory tests.
- Very low dimensional tolerances, between +0.1 and -0.2 mm. This means that the panels can easily be interchanged.
- Cores made of high-performance materials with very high densities.
- Compliance with UNE EN ISO 9001, guaranteeing quality controls during each stage of the manufacturing process.
- On the top surface, any 60 x 60 ceramic tile by Porcelanosa or other non-ceramic coverings (plastic laminate, linoleum, vinyl, granite, aluminium, steel, carpet, parquet etc) can be used.
- Tiles protected by a plastic surround to prevent the edges from breaking.
- A wide range of complementary products to ensure a good finish.
Panels with chipboard core

They are made of chipboard with a high-performance resin binder. Available in a thickness of 38mm, they feature an aluminum, galvanized steel or plastic lower covering, thus offering slightly different properties to suit each individual case. The panels have a plastic surround to prevent the edges from breaking.

Panel 38M1

Panel consisting of a chipboard core with a thickness 38 mm with a high-performance resin binder.

Lower coating 38M1A:

With aluminum sheet of thickness of 0.15 or 0.05 mm to create an excellent barrier against fire and moisture, while forming an equipotential frame to maintain electrical continuity features of the floor.

Inside coating 38M1F:

To increase the thermal stiffness and the total mechanical resistance, the panel comes with a galvanized steel sheet of thickness of 0.05 mm on the inside. This allows, in addition obtaining an excellent barrier against fire and moisture, while forming an equipotential frame to maintain electrical continuity features of the floor.

The perimeter is beaded with anti-crunching plastic material with a thickness of 1 mm of ABS to upper ceramic coating with a thickness of 0.45 mm of ABS to the rest of upper coatings.

Physical features (not including coating material):

<table>
<thead>
<tr>
<th>Standard Test</th>
<th>U.M.</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>mm</td>
<td>0.1 ± 0.2</td>
</tr>
<tr>
<td>Thickness</td>
<td>mm</td>
<td>0.1 ± 0.2</td>
</tr>
<tr>
<td>Diagonal difference</td>
<td>mm</td>
<td>Max. ±0.4</td>
</tr>
<tr>
<td>Slope</td>
<td>°C</td>
<td>±15%</td>
</tr>
<tr>
<td>Density</td>
<td>Kg/m³</td>
<td>±5%</td>
</tr>
<tr>
<td>Weight</td>
<td>Kg</td>
<td>±5%</td>
</tr>
<tr>
<td>Transverse electrical resistance</td>
<td>EN 1681</td>
<td>Q Max. ±18%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of stringers</th>
<th>Type of stringers</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.M.</td>
<td>L</td>
</tr>
<tr>
<td>Covered A</td>
<td>V</td>
</tr>
<tr>
<td>Non-covered</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal load (kN)</th>
<th>1.7</th>
<th>1.7</th>
<th>2.4</th>
<th>2.8</th>
<th>2.3</th>
<th>2.3</th>
<th>2.8</th>
<th>3.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum load (kN)</td>
<td>4.6</td>
<td>4.6</td>
<td>4.8</td>
<td>4.9</td>
<td>6.4</td>
<td>6.4</td>
<td>6.5</td>
<td>6.6</td>
</tr>
<tr>
<td>Uniformly distributed load (kN/m²)</td>
<td>14.0</td>
<td>14.0</td>
<td>18.0</td>
<td>22.0</td>
<td>21.0</td>
<td>21.0</td>
<td>25.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Class according to EN 13205</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

Note: the breaking load is obtained by multiplying by 2 the maximum load allowed.

Mechanical features

Panels with chipboard core

They are made of chipboard with a high-performance resin binder. Available in a thickness of 38mm, they feature an aluminum, galvanized steel or plastic lower covering, thus offering slightly different properties to suit each individual case. The panels have a plastic surround to prevent the edges from breaking.
Panel 38M2

Panel consisting of a chipboard core with a thickness 38 mm with a high-performance resin binder.

Lower coating 38M2A:
With aluminum sheet of thickness of 0.15 or 0.05 mm to create an excellent barrier against fire and moisture, while forming an equipotential frame to maintain electrical continuity features of the floor.

Lower coating 38M2B:
To increase the flexural stiffness and the mechanical resistance, it is applied in the panel a sheet of galvanized steel of thickness 0.5 mm on the lower side. This allows, in addition obtaining an excellent barrier against fire and moisture, to form an equipotential frame to maintain electrical continuity features of the floor.

The perimeter is beaded with anti-crunching plastic material with a thickness of 1 mm of ABS to upper ceramic coating with a thickness of 0.45 mm of ABS to the rest of upper coatings.

Physical features (not including coating material):

<table>
<thead>
<tr>
<th>Physical feature</th>
<th>Standard Test</th>
<th>U.M.</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>mm</td>
<td>-0.1 +0.2</td>
<td>598 x 598 600 x 600</td>
</tr>
<tr>
<td>Thickness</td>
<td>mm</td>
<td>±0.4</td>
<td>38</td>
</tr>
<tr>
<td>Diagonal difference</td>
<td>mm</td>
<td>Max.</td>
<td>≤0.4</td>
</tr>
<tr>
<td>Slope</td>
<td>°C</td>
<td>±15</td>
<td>3º</td>
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<tr>
<td>Swelliness</td>
<td>Kg/m²</td>
<td>±5%</td>
<td>650</td>
</tr>
<tr>
<td>Weight</td>
<td>Kg</td>
<td>±5%</td>
<td>8.9</td>
</tr>
<tr>
<td>Transverse electrical resistance</td>
<td>EN 1081</td>
<td>G</td>
<td>≤10⁴³⁸</td>
</tr>
</tbody>
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Upper coating:
<table>
<thead>
<tr>
<th>Type of coatings</th>
<th>38M2A</th>
<th>38M2F</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = Aluminum Sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F = Galvanized Steel Sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L = Plastic Laminate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V = Vinyl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D = Linoleum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G = Rubber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C = Carpet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P = Parquet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T = Ceramic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R = Stone recomposed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S = Natural Granite</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: U.M. is obtained by multiplying by 2 the maximum load allowed.

<table>
<thead>
<tr>
<th>Test standard – EN 12825</th>
<th>Type of stringers</th>
<th>Type of stringers</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.M.</td>
<td>SIN</td>
<td>L</td>
</tr>
<tr>
<td>Coverage: F. L.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentrated load centre of side of the panel (2.5 mm deflection) kN</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Maximum allowed load centre of side of the panel kN</td>
<td>3.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Concentrated load at the center of the panel (2.5 mm deflection) kN</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Maximum load allowed in the center of the panel kN</td>
<td>6.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Uniformly distributed load kN/m²</td>
<td>13.0</td>
<td>13.0</td>
</tr>
<tr>
<td>Class according to EN 13285</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Coverage: F. L. |
| Concentrated load centre of side of the panel (2.5 mm deflection) kN | 1.6 | 1.6 | 2.2 | 2.6 | 2.2 | 2.7 | 2.7 | 3.8 |
| Maximum allowed load centre of side of the panel kN | 4.1 | 4.1 | 4.2 | 4.3 | 5.6 | 5.6 | 5.7 | 5.8 |
| Concentrated load at the center of the panel (2.5 mm deflection) kN | 2.7 | 2.7 | 3.3 | 3.7 | 3.8 | 3.8 | 4.4 | 4.8 |
| Maximum load allowed in the center of the panel kN | 6.4 | 6.4 | 6.6 | 6.7 | 7.0 | 7.0 | 7.1 | 7.2 |
| Uniformly distributed load kN/m² | 14.0 | 14.0 | 17.0 | 20.0 | 20.0 | 20.0 | 21.8 | 29.0 |
| Class according to EN 13285 | 2 | 2 | 3 | 3 | 5 | 5 | 5 | 5 |

Coverage: F. L. |
| Concentrated load centre of side of the panel (2.5 mm deflection) kN | 0.8 | 0.8 | 0.9 | 1.1 | 1.3 | 1.3 | 1.4 | 1.5 |
| Maximum allowed load centre of side of the panel kN | 1.7 | 1.7 | 1.7 | 1.8 | 3.3 | 3.3 | 3.4 | 3.5 |
| Concentrated load at the center of the panel (2.5 mm deflection) kN | 1.8 | 1.8 | 1.9 | 2.1 | 2.4 | 2.4 | 2.5 | 2.6 |
| Maximum load allowed in the center of the panel kN | 2.1 | 2.1 | 2.1 | 2.2 | 5.0 | 5.0 | 5.1 | 5.2 |
| Uniformly distributed load kN/m² | 7.0 | 7.0 | 8.0 | 10.0 | 10.0 | 12.0 | 13.0 | 15.0 |
| Class according to EN 13285 | - | - | - | - | 2 | 2 | 2 | 2 |

Note: For breaking load is obtained by multiplying by 2 the maximum load allowed.
Panels with calcium sulfate core

It consists of a mineral soul of a single layer based on calcium sulfate of high density. It can be found in thicknesses of 15, 29 and 34 mm and with lower coating of aluminum or galvanized steel. As in the wood panels, the perimeter of all the panels has a plastic surround to prevent the edges from breaking.

Panel 30S

It is formed by a core of mineral of a single layer based of calcium sulfate, high-density 30 mm thickness, with a high-performance resin binder and completely free of wood particles.

Lower coating: 30SA:
With aluminum sheet of thickness of 0.15 or 0.05 mm to create an excellent barrier against fire and moisture, while forming an equipotential frame to maintain electrical continuity features of the floor.

Lower coating 30SF:
To increase the flexural stiffness and the total mechanical resistance, the panel comes with a galvanized steel sheet of thickness of 0.5 mm on the inside. This allows, in addition obtaining an excellent barrier against fire and moisture, while forming an equipotential frame to maintain electrical continuity features of the floor.

The perimeter is beaded with anti-crunching plastic material with a thickness of 1 mm of ABS to upper ceramic coating with a thickness of 0.45 mm of ABS to the rest of upper coatings.

Physical features (not including coating material):

<table>
<thead>
<tr>
<th>Test standard – EN 12825</th>
<th>30SA</th>
<th>30SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.M.</td>
<td>SN</td>
<td>L</td>
</tr>
<tr>
<td>Concentrated load centre of the panel (2.5 mm deflection)</td>
<td>kN</td>
<td></td>
</tr>
<tr>
<td>Maximum allowed load centre of the panel</td>
<td>kN</td>
<td></td>
</tr>
<tr>
<td>Concentrated load at the center of the panel (2.5 mm deflection)</td>
<td>kN</td>
<td></td>
</tr>
<tr>
<td>Maximum load allowed in the center of the panel</td>
<td>kN</td>
<td></td>
</tr>
<tr>
<td>Uniformly distributed load</td>
<td>kN/m²</td>
<td></td>
</tr>
</tbody>
</table>

| Coverage: A = Aluminum Sheet |
| | F = Galvanized steel sheet |
| | L = Plastic Laminate |
| | V = Vinyl |
| | D = Linoleum |
| | S = Natural Granite |

Note: the breaking load is obtained by multiplying by 2 the maximum load allowed.
Panel 15K

Consisting of mineral support material with a layer of inert nominal thickness 12.5 mm.

Upper coating consisting of whole stone of natural stone materials (marble or granite), nominal thickness of 20 mm, rectifying, polishing and chamfering.

The elaboration of the panel includes the rectification of precision to ensure the dimensional tolerances in both the perimeter and the thickness of the panel, to ensure a perfect modularity.

Lower coating 15KF:

To increase the flexural stiffness and the total mechanical resistance, the panel comes with a galvanized steel sheet of thickness of 0.5 mm on the inside. This allows, in addition obtaining an excellent barrier against fire and moisture, while forming an equipotential frame to maintain electrical continuity features of the floor.

The perimeter is beaded with anti-crunching plastic material with a thickness of 1 mm of ABS to upper ceramic coating with a thickness of 0.45 mm of PVC to the rest of upper coatings.

Physical features (not including coating material):

<table>
<thead>
<tr>
<th>Standard Test</th>
<th>U.M.</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>mm</td>
<td>-0.1 x +0.2</td>
</tr>
<tr>
<td>Thickness</td>
<td>mm</td>
<td>-0.1 x +0.2</td>
</tr>
<tr>
<td>Diagonal difference</td>
<td>mm</td>
<td>Max.</td>
</tr>
<tr>
<td>Slope</td>
<td>ºC</td>
<td>±15</td>
</tr>
<tr>
<td>Density</td>
<td>Kg/m³</td>
<td>±5%</td>
</tr>
<tr>
<td>Weight</td>
<td>Kg</td>
<td>±5%</td>
</tr>
<tr>
<td>Transverse electrical resistance</td>
<td>EN 181</td>
<td>Ω</td>
</tr>
</tbody>
</table>

15KF

Fire Resistance | EN 13501-2 | Class Bfl
Fire Reaction   | EN 13501-1  | 30

Mechanical features:

<table>
<thead>
<tr>
<th>Table – Technical Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test standard – EN 12825</td>
</tr>
<tr>
<td>Coverage: S</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Load/Type of stringers</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Load/Type of stringers</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
</tr>
</tbody>
</table>

Note: the breaking load is obtained by multiplying by 2 the maximum load allowed.

Upper coating

S = Natural Granite
**Pedestals**

100% galvanised steel structure. The pedestals dictate the floor height according to the project requirements. Each pedestal incorporates series of plastic noise-reduction heads fitted with four positioning lugs. One of the main advantages of the pedestal system is that it is fitted with a 14 mm threaded bolt that can be adjusted to accommodate different floor height requirements.

**Stringers**

Like the pedestals, the stringers are made entirely of galvanised steel. Their main function is to increase the strength of the floor. They are covered with special noise-reduction strips.

**Structure**

The structure is made up of pedestals and stringers, which support the floor covering and ensure the necessary height and rigidity.

### Pedestals

- **Pedestal with screw-in fitting for reduced height (nominal values of 55,70 and 85)**
- **Pedestal with tube for higher heights (from 100 mm nominal).**

In both versions, the pedestal is made entirely of galvanised steel (minimum thickness of 3μ, white color) on all surfaces (both visible as not) and including the cut parts by galvanizing bath based of zinc C3. + electro deposited.

### Pedestal Models

<table>
<thead>
<tr>
<th>Model (nominal height)</th>
<th>055</th>
<th>070</th>
<th>085</th>
<th>100</th>
<th>115</th>
<th>150</th>
<th>190</th>
<th>220 + 620</th>
</tr>
</thead>
<tbody>
<tr>
<td>Versions</td>
<td>with screw-in fitting</td>
<td>with tube</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal height mm</td>
<td>55</td>
<td>70</td>
<td>85</td>
<td>100</td>
<td>115</td>
<td>150</td>
<td>190</td>
<td>1100</td>
</tr>
<tr>
<td>Nominal range of height adjustment mm</td>
<td>±10</td>
<td>±15</td>
<td>±15</td>
<td>±30</td>
<td>±30</td>
<td>±40</td>
<td>±30</td>
<td>±50</td>
</tr>
<tr>
<td>Permissible axial load with safety factor 2 (ref. UNE EN 12825) kN</td>
<td>40</td>
<td>30</td>
<td>25</td>
<td>22</td>
<td>21</td>
<td>20.5</td>
<td>28</td>
<td>20</td>
</tr>
</tbody>
</table>

(*) The allowable axial load is given in the first deformation. The breaking load or collapse load is obtained by multiplying the permissible axial safety factor equal to 2.

From the point of view of performance, it represents a high resistance to bending vertical load and / or eccentric, thanks to a screwed bolt M16 section, a tube of diameter 20 mm of thickness of 2 mm, internally calibrated to obtain a coupling with smaller tolerances and therefore less spaces and a direct connection between the screwed bolt of the disc base and tube, without need of interposing deformable plastic elements.

To ensure electrical continuity of the pedestal, the base disc has been drilled to accommodate the screw and nut for electrical connection.

In the disc of base have been added 4 holes of 8.5 mm and 3 holes of 6.5 mm, at the height of the radial nerves, to enable and facilitate the injection of fluid adhesive on the back of the base when the pedestal is already installed.

When necessary, and with a simple intervention without special tools, the structure offers the possibility to adjust the height of the pedestal shortening the tube of necessary.

> 100 mm

< 100 mm

Screw-in fitting version

Screw version
PSA pedestals

It is supplied in a unique version with adjustment under the head to cover a range of nominal heights of finished pavement of a minimum of 110 mm up to 500 mm. The nominal height of the finished pavement is achieved by adding the thickness of the panel to the nominal height of the pedestal. The pedestal is made completely of steel with galvanized superficial treatment of minimum thickness of 3μ by galvanizing bath based on chromium ions electro deposited, applied to all surfaces. The pedestal consists of two main elements: the head riveted to the screwed bolt and base disc riveted to the tube. The pedestals are supplied with joints to the head, semi-rigid plastic printing, black, conductor, carrying an anti vibration function of air sealing and centering of the panel.

### Model (nominal height)

<table>
<thead>
<tr>
<th>Version</th>
<th>75</th>
<th>95</th>
<th>130</th>
<th>170</th>
<th>200</th>
<th>260</th>
<th>310</th>
<th>360</th>
<th>410</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal height</td>
<td>mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td>75</td>
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<td></td>
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</tbody>
</table>

It recognizes that the raised technical floor has obtained the certification PSA Medium Grade with the following settings:

- 35SF panel
- Structure with pedestal of nominal height of 410 mm, set at a maximum height of 450 mm, and stringers of type "P".

Therefore, for heights higher to 450 mm and with panels or other structures, the obtained certification is not applicable.

### Overview of the pedestal

The following is an overview of the pedestal above mentioned.
### References

<table>
<thead>
<tr>
<th>KEA</th>
<th>Description</th>
<th>SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>B80305062</td>
<td>PEDESTAL H = 55 MM (-10/+15)</td>
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</table>

### Joints to head of pedestal

Junto para la cabeza del pedestal, de plástico semiflexible estampado, no conductor (resistencia eléctrica $R > 10^{10}$ Ohm) de color negro opaco, peso nominal 2,5 grm, y de forma cuadrada con ángulos redondeados. Cada ángulo está provisto de un diente de agarre para centrar y enganchar el cabezal de la base de sujeción. En la parte superior, está provisto de cuatro dientes para el posicionamiento y el centro de los paneles. La junta actúa también atenuando los ruidos. Su peso nominal es 5 gr.

### Joints to head of PSA pedestal

Junto para la cabeza del pedestal, plastico semiflexible estampado, no conductor (resistencia eléctrica $R > 10^{10}$ Ohm) de color negro opaco, peso nominal 2,5 grm, y de forma cuadrada con ángulos redondeados. Cada ángulo está provisto de un diente de agarre para centrar y enganchar el cabezal de la base de sujeción. En la parte superior, está provisto de cuatro dientes para el posicionamiento y el centro de los paneles. La junta actúa también atenuando los ruidos. Su peso nominal es 5 gr.

### References

<table>
<thead>
<tr>
<th>KEA</th>
<th>Description</th>
<th>SAP</th>
</tr>
</thead>
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<tr>
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<td>B80305256</td>
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<tr>
<td>B80305790</td>
<td>Junta de pedestal</td>
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</table>
**Strings**

**butech** can supply two different types of stringers:

- Basic stringer of orthogonal direction connection (versions "L", "M" or "P")
- Additional stringers of diagonal direction connection (versions "D" or "X")

All stringers are produced by cold stamping galvanized steel sheet (minimum thickness of 0.3 mm), with special profile and are designed to improve mechanical endurance and ensure reduced tolerances of modules and the ease of exchange them.

Its blockage in the nodes by auto-tapping metric screws ensures the electric continuity of the system and gives a great stability to the structure.

**Strings version “L” (light)**

Lightweight Stringer ("L") has been obtained by means of stamping cold from galvanized steel sheet (material: 1.1470 + 2150 according to EN 10142 with minimum thickness 15 μ hot dip galvanizing). They are opened section (30 mm wide, 21 mm height, 0.8 mm thick) and 220 gr. weight. The stringer is equipped at both ends with the “snap-on” system, a system of special hook that allows optimum and fast placement on the radii of the head of the pedestals, that ensures electrical continuity of the system.

**Strings version “M” (medium)**

Medium Stringer ("M") has been obtained by means of stamping cold from galvanized steel sheet (material: 1.1470 + 2150 according to EN 10142 with minimum thickness 15 μ hot dip galvanizing). They are opened section (30 mm wide and 38 mm height, 0.8 mm thick), and 390 gr. weight. It has longitudinal nerves, present also in the vertical sides and the laps of the bottom side, to increase benefits with respect to bending, in comparison with the previous type "L", and improve the way to control the deformations. In addition to the hole for the ground connection, the ends are equipped with the system of special hook “snap-on” that allows optimum and fast placement on the radii of the head of the pedestals, for the lock with screw, ensuring in that way electrical continuity of the system.

**Strings version “P” (heavy)**

Heavy Stringer ("P") has obtained a special profiling of galvanized steel which increases its performance with respect to the "L" and "M" models (material: 1.1470 + 2150 according to EN 10142 with minimum thickness 15 μ hot dip galvanizing). They are closed section (30 mm wide, 10mm high and 1 mm thick) and 600 gr. weight. The ends are fitted with a system of special hook that allows optimum and fast placement on the radii of the head of the pedestals. The stringer is equipped with a hole for the ground connection.

**Strings of diagonal connection (version “D” or “X”)**

All the stringers are supplied with special joints of black extruded plastic with anti vibration function and air tightness. They do not have sharp edges, especially dangerous during handling and assembly, which may damage the plastic covering to pass underneath.

**References**

<table>
<thead>
<tr>
<th>KEA</th>
<th>Description</th>
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<tr>
<td>B8030792</td>
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<td>trama de yeso (bajar lados)</td>
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<td>B8030322</td>
<td>trama de yeso (bajar lados)</td>
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</table>

**Screws for stringers L/M/P types of structure**

The screws, made of galvanized steel, are used to connect the STRINGER at the head of the pedestal to give greater security and stiffness to the system stiffness.
Joint for stringers

Extruded black plastic, thickness of 1 mm, non-conductive, anti vibration function and air tightness. The joint is applied in the stringer with a simple hand pressure.

Joint for stringers type L, M and P

<table>
<thead>
<tr>
<th>Section dimensions</th>
<th>30x6 mm</th>
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<tbody>
<tr>
<td>Nominal length</td>
<td>546 mm</td>
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<tr>
<td>Nominal amount</td>
<td>5.7 pz/m²</td>
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</table>

Joint for stringers type X and D

**Type D**

<table>
<thead>
<tr>
<th>Section dimensions</th>
<th>20x6 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal length</td>
<td>765 mm</td>
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<tr>
<td>Nominal amount</td>
<td>2.8 pz/m²</td>
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</table>

**Type X**

<table>
<thead>
<tr>
<th>Section dimensions</th>
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</thead>
<tbody>
<tr>
<td>Nominal length</td>
<td>315 mm</td>
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<tr>
<td>Nominal amount</td>
<td>11.2 pz/m²</td>
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</table>

References

<table>
<thead>
<tr>
<th>KDA</th>
<th>Description</th>
<th>SAP</th>
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<tr>
<td>B03061234</td>
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<td>B030612351</td>
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</tbody>
</table>

Types of structure

The structure offers several configuration options that can be performed using both orthogonal and diagonal stringers, increasing the mechanical stability and capacity of the pavement. Such stringers are used light, medium and heavy which are placed in the radii of the head of the pedestals. The diagonal stringers D or X (stringers shape) can be used with any orthogonal stringer (L, M or P).
Sound proofing properites of RAF

A room’s soundproofing capacity depends on the soundproofing properties of each of its components, including the floor.

The factors that influence a RAF’s soundproofing capacity are the material that the top covering is made of, the material of the core and its density, and the height of the plenum.

butech’s RAFs are made of ideal soundproofing materials with the right densities to guarantee the best soundproof protection, with cores with a density of up to 1,500 kg/m³.

To ensure maximum comfort and good soundproof protection, butech conducts rigorous soundproofing tests of its floors, in accordance with DIN 52210. This standard analyses four different cases: protection against airborne noise, impact noise, horizontal airborne noise and vertical airborne noise.

The table below allows obtaining the dB correction factors, which need to be added or removed for panels with multiple covers, starting with those without coating (those listed in the first table).

<table>
<thead>
<tr>
<th>Type of coating</th>
<th>Correction factor [dB]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vinyl (V), rubber (G), linoleum (D)</td>
<td>1</td>
</tr>
<tr>
<td>Laminate (L), Steel (F)</td>
<td>-1</td>
</tr>
<tr>
<td>Natural stone (S) and reconstructed (R), Gres (T)</td>
<td>-1</td>
</tr>
<tr>
<td>Parquet (P)</td>
<td>0</td>
</tr>
</tbody>
</table>

Horizontal transmission of noise

In the data presented are the steps taken in a real building in accordance with current regulations (EN ISO 140-12), to assess the effect of reduction of the floor of modular access in relation to the horizontal transmission of aerial noise (as how a person on a floor of a building perceives the ambient noise present in an adjacent floor).

In this case, measures are taken with a modular access floor already installed. The noise pressure levels are taken in the two adjacent floors and the horizontal aerial noise attenuation expressed by the norm of the parameter Dnfw, measured in dB (decibels).

The higher the value the greater the reduction in relation to the object to be tested and therefore the greater the reduction in aerial noise transmission from one floor to the adjacent.

The following data were collected from the panels:

- The height of the supports was 300 mm for all configurations.

**NOTE:** The height of the supports was 300 mm for all configurations.

**Attenuation of horizontal aerial noise (Dnfw) depending on access floor configuration**
The correction factors in dB, which are necessary to obtain the corresponding data for 38M2A panels (of 38M1A) and 30SA (of 35SA) are shown in the table below.

<table>
<thead>
<tr>
<th>Type of coating</th>
<th>Correction factor [dB]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium sulfate 30S</td>
<td>-1</td>
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<tr>
<td>Chipboard 38M2</td>
<td>0</td>
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<tr>
<td>Natural stone (S) and reconstructed (R), Ceramic tile (T)</td>
<td>-1</td>
</tr>
</tbody>
</table>

Finally, the correction factors in dB are shown below for obtaining panel data with a lower cover in steel instead of aluminum.

<table>
<thead>
<tr>
<th>Type of coating</th>
<th>Correction factor [dB]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel (F)</td>
<td>0</td>
</tr>
</tbody>
</table>

Vertical transmission of noise

In the presented data are the steps taken in a real building in accordance with current regulations (EN ISO 140-8), to evaluate the effect of reducing the modular access floor in relation to the transmission of noise surface of the panel (so how a person in a floor of a building perceives the noise present in an upper floor). In this case, measures are taken first without the modular access floor in order to determine the features of the building itself. The same measures are taken then with the modular access floor already installed. The measurements are recorded for the description of the differences of the effect of the added element (modular access floor). We present the test results of impact noise reduction panel expressed by the parameter ALW measured in dB. The higher the value the greater the reduction in relation to the object to be tested and therefore the greater the reduction in the transmission of noise when walking on the floor that is transmitted to the lower floor.

The following data were collected from the panels:

The first diagram shows ALw values obtained in different structural configurations, and panels 38M1A and 35SA. The observed conditions differed depending on whether there were stringers or not, if there was a noise insulation sheet placed between the support and the tile and if it was stuck or not (required to stick the pieces have been installed without stringers).

NOTE: The height of the supports was 300 mm for all configurations.

Vertical impact noise attenuation (ΔLw) depending on the configuration of the access floor

The table below allows obtaining the dB correction factors, which need to be added or removed for panels with multiple covers, starting with those without coating (those listed in the first table).

<table>
<thead>
<tr>
<th>Type of coating</th>
<th>Correction factor [dB]</th>
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<tbody>
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<td>Natural stone (S) and reconstructed (R), Ceramic tile (T)</td>
<td>-2</td>
</tr>
<tr>
<td>Parquet (P)</td>
<td>1</td>
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</table>
The correction factors in dB, which are necessary to obtain the corresponding data for 38M1A panels and 30SA are shown in the table below.

<table>
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<tr>
<th>Type of coating</th>
<th>Factor [dB]</th>
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<tr>
<td>Calcium Sulfate 30S</td>
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<tr>
<td>Chipboard 38M1</td>
<td>-1</td>
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</tbody>
</table>

Finally, the correction factors in dB are shown below for obtaining panel data with a lower cover in steel instead of aluminum.

<table>
<thead>
<tr>
<th>Type of coating</th>
<th>Factor [dB]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel (F)</td>
<td>-1</td>
</tr>
</tbody>
</table>

Installation of RAF

General information

The first stage of the installation begins with the definition of the two initial orthogonal axes, previously agreed with the Director of Operations and / or verifiable drawings or drawings. The operation is carried out by attaching to the walls, a pair of orthogonally twisted nylon threads, at a height slightly higher than the system where it will be installed. To determine the angle (90°) of the two threads use the Pythagorean Theorem or simply 3-4-5 formula: starting at the crossing of the two threads, that delimit 3 m. in one and 4 m. in the other. The diagonal between the 2 points should be 5 m. (The larger the diagonal, the smaller the margin of error).

Installing a structure without stringers

The four pedestals must be completed with joints and already be leveled according to the altitude.

Place the first panel so that one corner is perfectly placed at the point where the threads cross (the position in terms of height can be obtained using a bubble level or laser level).

Continue placing the parallel rows of panels, using the same method described above, until all the inside panels have been installed. Be particularly careful about making sure the panels are at right angles, lined and flat.

To ensure that all panels form a smooth surface, it is important not to disturb the floor during installation and for a minimum of 24 hours after the glue has been applied, the minimum time required for fixing the glue properly.

NOTE: All supports must have joints.

Installing the stringers structure

Starting at the points where the two octagonal threads cross and aligning with them, install and screw in the different components of the structure, pedestals, stringers and screws.

Place the first wood panel so that one corner is perfectly placed at the point where the threads are crossed, then set the second panel being careful to align with the reference panel.

Continue placing panels in parallel with nylon threads until all panels have been placed, ensuring that all panels are at right angles, lined and flat.

All pedestals and stringers must have joints.

When installing floor over 500 mm. of height it is advisable to fix the pedestals to concrete slab with glue (taking care not to disturb the floor at least 24 hours after being applied).

Installation in perimeter zone

With structures of stringers, cut the stringers of perimeter to the required measure, fixing them with the proper screws and adjusting to the required height pedestals (the hole at the end of the stringers-cutting can be done directly with fixing screws). Cover the stringers and pedestals with joints which have been cut to size.

Finish the floor cutting all the panels to the correct perimeter at correct measure, making sure that follow the shape of the wall perfectly. One of the simplest ways to do this is by placing the panel that needs to be cut next to the new adjacent to the perimeter, using a separator ribbons panel, pass through the wall, supporting a pencil in the separator so that the exact part to be cut can be marked.

When so requested, it is possible to apply a layer of varnish to act as anti-dust protection on the sides of the molded panels.
Installation design

Suggested procedure

Bolting the design dimensions is possible to draw a grid floor installation.

• The grid is drawn according to strict procedures with regard to customer requirements that are stipulated in the contract for the installation (for example with a 45° installation, or according to a principal axis, or a project reference, etc.).

• If no such indications, the grid should be positioned by calculating the minimum possible waste and avoiding small perimeter panel sections, setting initial two orthogonal axes.

• To place them correctly, you should cut all perimeter panels. If necessary, adjust complete panels to the perimeter walls if the walls are not perfectly linear, and therefore do not offer enough support or assurance that the panels are aligned properly. When possible, avoid close perimeters with panels less than 150 mm size, because they are less stable.

• This procedure of graphic design can be carried by placing a sheet of paper with a squared tracing to the same scale on a map of the area, alternatively, using a computer program design. This procedure is extremely important to install the panels properly as it allows the necessary amount of material is determined and shown to planners and installers the position of the pedestals and, thus, where the systems themselves fit.

• To make the system easier to fit, it is also possible to trace the design of the floor in advance and thus mark the position of the pedestals with paint color.

• This procedure can be carried out in different ways, but always in multiples of 600 mm.

• It is often advisable to trace the surface with a suitable anti-dust varnish, usually vinyl or polyurethane. This serves to fix the concrete surface of the slab and prevent accumulation of dust. This varnish is essential when the floor is to be used for air conditioning. To ensure that the concrete slab is painted correctly, it must be thoroughly cleaned. After its application is advisable to let the varnish dry for a day at least. The procedure of varnishing will be faster and more efficient if done before the installation system is installed. It is necessary to ensure that the anti-dust varnish is compatible with the adhesive used to attach the supports. Any dirt or dust apparrel of the works in the floor can be removed using a vacuum cleaner.

Assembly sequence

Working procedure

1. The correct assembly sequence is:
2. Check the status of progress of the construction site.
3. Check the installation’s design follows the lines of the tracing.
4. Install high technical floor.

During the installation process it is necessary:

• Decide the best assembly sequence for any interior wall or false ceiling.

• Limit access to the area. If adhesives are used for fixing the panels to the structure, the panels should not be stepped on at least 48 hours after the placement has been completed.

• Maintain access to the building site and the building where the floor is being installed free of obstacles, so that materials can be unloaded near the place or lifting equipment.

• Maintain horizontal access to the area and free obstacle lifting devices to facilitate transportation between pallets.

• Ensure clear routes for trucks of pallets to transport materials for the area can be efficiently carried out.

• Stipulate by contract the features and use of lifting devices for vertical transport.

• The raised technical floor should be formally approved as soon as it has been installed in each individual environment, before any protection and coating are applied and in any case before any other operation by the employees of the installation.
General site conditions

General information

The in-situ inspection allows that the general conditions of the place, the dimensions of the installation area, floor level, and / or correspondence from the planimetry to gather any additional information and useful details for proper installation, in-situ inspection must be performed by authorized personnel from the workplace, including:

- Customer
- Director of operations
- Foreman of the place

Required information

You need the following information:

- The structure and shape of the perimeter walls.
- A clear definition of the devices used to transport between building floors (e.g. trucks, road trains, etc.).
- The method used to download material (crane, tower crane, forklift...), and the work involved.
- The method of transport to be used to transport material within the installation area (crane, hoist, etc.).
- The dimensions and sizes must be compatible with the methods of transportation.
- The height of the floor must be indicated on the final draft.
- Predisposition of an area for collecting material to dispose.
- The presence of pipes that alter the hygrothermal parameters. It is recommended to isolate all sources of heat and provide an adequate ventilation system fitted with bars to ensure constant environmental conditions.
- The condition of the construction operations of the wall. All wall construction must be completed at least 60 days prior to installation, the activities of other operators should be completed at least 10 days prior to installation.
- The condition of the installation of windows and doors frames. The sizes and dimensions must be compatible with the transport devices when using a crane.
- Condition of the concrete slab.
- Compatibility with anti-dust products (if applicable) with the adhesive glue used to attach the pedestals.
- Compatibility with anti-dust products (if applicable) with the adhesive glue used to attach the pedestals.
- The state of the place of work of construction.
- The construction zone should be cleared of all materials of access and to be clean before starting the installation. No worker or installer that is not part of those who work in installing the floor should have access to the area.
- Distribution of service. All service installations must comply with the design of the floor and take into account the overall dimensions of all components.
- Specifications related to the installation of the floor level. The floor level of access must be clearly indicated by the Director of Operations. The floor level compatibility with any eventual external constraint must be defined before starting the installation; all restrictions must be clearly communicated in the installation contract.
- The presence of transport routes for the relocation of material.

General site conditions

- The state of the place of work of construction.
- The construction zone should be cleared of all materials of access and to be clean before starting the installation. No worker or installer that is not part of those who work in installing the floor should have access to the area.
- Distribution of service. All service installations must comply with the design of the floor and take into account the overall dimensions of all components.
- Specifications related to the installation of the floor level. The floor level of access must be clearly indicated by the Director of Operations. The floor level compatibility with any eventual external constraint must be defined before starting the installation; all restrictions must be clearly communicated in the installation contract.

General storage conditions

General information

The environments where technical raised floor is to be installed must be checked beforehand to ensure their suitability. Recommended parameters are:

- The environment should be dry and have sealed windows and door frames.
- The level of moisture and temperature of storage should comply with the specifications described on the packaging.
- The packaging must be handled with appropriate means of transport, such as pallet, etc...
- It is not advisable to stack the box.
- The packaging should be protected from impacts.
- Store away from heat sources.
- Store near the area in which to settle the floor.
- Do not unpack the materials unless strictly necessary. When unpacking, be careful when handling components to avoid damage and ensure traceability.
- Follow the manufacturer’s instructions that are on the packaging.

Pallet of 60x120 with cardboard protection. Average height 120 m

Pallet of 60x120 with cardboard protection. Average height 120 m
Installation of finishes of perimeter.

The finish on the perimeter, where no spikes against a wall, made of chipboard covered with tape on both sides of melanin, closes the perimeter area is visible and can be placed with a metal in an “L” in some cases, for example, when the difference in height between the floors is less than 17 cm, can also be used as a step.

When you set the position where the steps are to be installed, it is necessary to remove the pedestals 4.5 cm. and align with the axis of the panels. At this point, place the board that acts as a lift against the axis of the panels and adjust it to the slab using screw caps and supports.

Perimeter boards are installed at the same height as the floor have an aluminium corner that can be easily fixed with wood screws and cover the thickness of the board itself and complete it from an aesthetic standpoint.

Raised access flooring for exteriors

The raised access floor (RAF) system for terraces has been specially created to provide an aesthetic solution for terraces containing unsightly drainage slopes. By building a completely flat floor over the existing terrace floor, these slopes are conveniently hidden underneath.

Height deviations are offset with height-adjustable plots and any accumulated water is drained through open joints on the newly paved surface and then channelled down the terrace’s waterproofed slopes to the drain.

Advantages

- The system can be used to create a flat paved surface over sloping masonry floors with height deviations of up to 2%. Any height deviations over 2% will need to be corrected with mortar or with wedges.
- The creation of an air void under the newly paved surface generates a continuous flow of air through the pavement joints, which prevents the build-up of condensation and also produces an insulation layer.
- The under floor void, can also be used to house cables, pipes, etc.
- Easy to access this space under the floor (do not use P-404 to bond tiles and plots in areas where you need to access the services underneath and be able to have space to work on it).
- The cavity between the raised floor and the living area below also helps to reduce the penetration of noise into the home.
- The system is quick to install as the tiles and supports are installed at the same time.
- Advantages of PORCELANOSA Group: pavement Easy to clean, low dimensional tolerances, wide variety of finishes, hardness, etc.
The external RAF is an over-raised type of pavement developed by PORCELANOSA Grupo used for terrace covering and external areas. This type of over-raised pavement allows flat surfaces on exterior supports that have slope, improving the aesthetic vision, the waterproofing and the drainage.

It is a type of over-raised pavement with special ceramic tiles that are arranged on plastic PVC plots of adjustable height, so that a hollow space is determined between the support and the floor tiles.

The elements that make up this system are as follows:

**Outdoor tiles to RAF for exterior**

PORCELANOSA Grupo ceramic pieces.

The external RAF ceramic tiles consist of two porcelain stoneware slabs or technical porcelain stoneware by PORCELANOSA Grupo stuck with hot melt reactive to moisture. They are made with a sufficient thickness to withstand the breaking load demanded on these over-raised pavements.

Thus, its main technical features are as follow:

- **Format:** variable.
- **Thickness:** between 20 mm and 30 mm approx.
- **Water absorption:** <0.5 %.
- **Breaking load:** > up to 9.8 kN.
- **Resistance to chemical attack:**

These porcelain stoneware slabs or technical porcelain stoneware by PORCELANOSA Grupo are manufactured with needed thickness to withstand the breaking load indicated above, which does not mean that on heavy shock or falls of heavy objects cannot produce the breaking of the same.

**Structure of RAF for exterior**

Plots with adjustable height.

These plots, made of waterproof plastic, are the support on which the ceramic tile of external RAF rests. They determine the height of the system and width of the joint between slabs.

This element consists of the following parts:

- **Plot base:** Large diameter base that distributes the weight on the support system.
- **Adjustable height rod:** that allows adapting height of the plot to the needs of the pavement over-raised.
- **Head:** It is where the external RAF rests. It has 4 dividers that determine joints of placement of a width of 4 mm.

The total height of the plot can be adjusted for different adjustable heights.

**Plots properties**

- Manufactured by thermo-injection.
- Colour: black.
- Base of the material: polypropylene with mineral calcium carbonate side.
- Technical stability: (-15ºC + 120ºC).
- Dimensional stability.
- Mechanical average capacity to compression (up to 1,200 kg / unit).
- Resistant to aqueous solutions of inorganic salts, acids and alkalis.
- Resistant to most organic solvents as alcohol, esters and ketones.
- Resistant to commercial detergents and bleach solutions.
- Resistant to microorganisms for not being cultivation ground for these.
- It does not punch the waterproofing sheets or thermal insulations.
- Plots come marked with the slope to compensate (1% or 2%) and the installer will point the distinctive flange towards the drain. This flange determines the maximum height, which has to point towards the drain.
- In angle or wall areas, top support flanges can be cut off to make the finishes fixing easier.
- Not resistant to oxidizing substances as nitric or sulfuric acid and halogenated hydrocarbons such as gasoline.
- Finishes of surfaces which allow the installation of plots:
  - Mortar compression layers.
  - Butyl fabrics.
  - Auto protected asphalt fabrics.
  - Directly on the thermal insulation (extruded polystyrene with density ≥ 25 kg/m3).
  - Sheets of PVC and TPO.
  - Folding of common brick.

**Prohibited its installation:**

- in its entirety in facilities of animals such as pig farms, etc.
- in facilities where there is road traffic (cars, trucks, etc.)
- on chippings, cellular concrete, directly on the ground and on not protected asphalt sheets.
Installation of RAF for exterior

The weft of ceramic tiles is determined by the position of the plots. The external RAF slabs rest on these placed on the four corners of the tile, at least, although other positions may be placed depending on the format size. Plot consumption per m² depends on the chosen format.

The plots are glued to the support using polyurethane adhesive (P-404). Similarly, and to avoid the tiles shaking, they are adhered to the plot.

This system is adapted to the needs of each customer, so in that way and from the project data, butech adapts the external RAF to the particularities of each project.

The position ensures good stability to the system and allows greater flexibility in the design of the ceramic weft, and it can design placements with catch joint.

The plots are to be placed on a solid support and a maximum gradient of 2%. For indoors, the support must be covered by a waterproof sheet, while outdoors, where no waterproofing system is required, the plots may rest directly on the support, if it is solid and stable, with the flap fitted directed toward the drain.

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This type of pavement in terraces avoids the need for cement mortar screeds for subsequent placement of cement-based tile adhesive. This system avoids the disadvantages of terraces that may arise from the traditional placement of direct adhesives. The problems arising from variations in temperature, structural settlements or poor performance of the flooring are eliminated. It also allows obtaining additional benefits as a convenient accessibility at any time, allowing correct possible defects in the existing waterproofing and easy start work without the need for highly specialized, reduced noise transmission and thermal protection of the room beneath the system due to the creation of an air chamber that is in constant ventilation and the joints between tile and tile 4 mm left open for drainage of water.

References

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Ask for higher heights
**Dry installation floor**

New ceramic pavement system placed dry, without use of adhesives or joints, for indoor use. Quick and easy installation, accessible, recoverable, wide range of finishes and minimal maintenance. Quick come into service, once placed it is ready to transit on it.

Coating for pavements of dry inside areas in premises of individual or collective use:

- Office buildings.
- Buildings of public use (administration, culture, museums, cinemas, etc...)
- Shopping centers.
- Hotels.
- Showrooms.
- Shops.

**CLI-KER n**

Automatic Installation System

<table>
<thead>
<tr>
<th>Name</th>
<th>Testing method</th>
<th>System</th>
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<tr>
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<td>Width</td>
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<tr>
<td>Density (Polyurethane)</td>
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<td>1.210 kg/m³</td>
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</table>

**Dry installation floor**

Because cli-ker is a lift-up tile system, the tiles can be swiftly and easily changed if needed.

The tiles click into place thanks to a simple tongue and groove backing system.

Close-up of how the tiles fit together.

In this way, you can gain access to the under-floor area just by lifting up a tile.
Advantages

- Quick and easy installation.
- Clean.
- Accessible.
- Reusable.
- Wide range of finishes.
- Minimum maintenance.
- Quick come into service, once placed it is ready to transit on it.

Components

The piece made in factory consists of the following:

- Ceramic tile or porcelain of groups Blb and Bla as ISO 13006 and NF-EN 14411 of Porcelanosa Grupo.
- Joint of polyurethane of 1 mm wide available in gray.
- Base of polyurethane two-component rigid with cracks in the 4 corners shaped blade.

Additional elements for placement are:

- Pieces of union, locks in the form of blade of 5 mm height in polyurethane.
- Pieces of regulation or compensation, rises and plugs of polyurethane, for leveling of the system. Thicknesses of 0.5 - 1 mm for the rises and 5 mm for the plugs.
- Leveling sheet viscoelastic and acoustic attenuation.

References

<table>
<thead>
<tr>
<th>SRP</th>
<th>RSA</th>
<th>Description</th>
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<td>10007630</td>
<td>B119001007</td>
<td>Compensation piece 0.5 mm high</td>
</tr>
<tr>
<td>10007631</td>
<td>B119001008</td>
<td>Compensation piece 1 mm high</td>
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<tr>
<td>10007632</td>
<td>B119001009</td>
<td>Plug 5 mm high</td>
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<tr>
<td>10007633</td>
<td>B119001001</td>
<td>Catches 5 mm high</td>
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<tr>
<td>10007634</td>
<td>B119001002</td>
<td>Levelling sheet (Viscoelastic)</td>
</tr>
</tbody>
</table>
Installation

Foregoing considerations

- The support must be dry, free of dirt, construction debris or irregularities.
- Check that the irregularity does not exceed 1.5 mm every rule of 2 m. The accumulated irregularity shall not exceed the deflection of the piece. There will be a previous rethink taking as origin the intersection of 2 offset axes. It will be previously installed all the pavement with locks of 5 mm high.
- There will be a taking of levels later and a visual inspection verifying that the pavement is firm, smooth and without lipping of tiles. It is possible the devasting of the base of polyurethane for surface leveling.
- It must be left a perimeter joint of 0.5 cm, which will be hidden once placed the skirting board.
- In addition to the components supplied for placement, we must have pliers, cutter, machine of ceramic cutting and rubber mallet.

Installation steps

First of all, you must check that the bracket fulfills the minimum requirements to put the clinker described above.

From that moment on you’ll have to follow next steps:

Step 1:
We cover the area to be paved with leveling sheet.

Step 2:
Use Cintex to seal the joints between sheets.

Step 3:
Fix the catch on the piece that is going to be laid. Then we put the piece on the leveling sheet placed on the floor.

Step 4:
Repeat the process with the help of a rubber mallet to fit the pieces until covering all the area.

Step 5:
Use a level to place all the pieces appropriately. Plots are put on the catches to help leveling the floor.

Step 6:
Close to walls or columns, catches should be cut with a cutter or pliers, to join pieces and level them with that wall or column.

Step 7:
In case that it is required cutting the pieces, we will use a ceramic cutting machine.
Once the piece is marked with ceramic cutting machine, in case of being the buttons of ceramics on the optimistic side, we will review the trimmings with a radial provided that necessary, then through a dry knock we split the piece.

Step 8:
When cutting the piece, we will lose the mechanized of the corner in which to place the lock.
For these purposes we will use some plugs of polyurethane, placing as many as necessary, fitting and sticking them on the basis of polyurethane.

* For the installation of screens on the system, it will be used a plug of polyurethane for proper fixation, protecting the ceramic until the corner.
CLI-KER n® exterior
Automatic Installation System

Click-ker n exterior is a new ceramic flooring system created by PORCELANOSA butech, for quick and easy, dry installation of exterior floors. No use of mortar or joints needed.

Quick and easy installation, accessible, recoverable, wide range of finishes and minimal maintenance. Usable right after its installation.

Advantages

- Easy installation
- Clean and quick
- No maintenance
- No adhesives or grout needed.
- Anti-slip tile
- Adapted to all slopes
- Wide range of finishes from PORCELANOSA
- Reusable
- Frost-resistant tile

Features

The use of click-ker n exterior system is recommended when the surface to tile meets the following requirements:
Terraces with 1 slope, 2 slopes or 4 slopes, when the angles form 90 degrees.

- Tile format: 44.8 x 44.8 cm
- 5 mm hollow joint between tiles
- Machined base and pieces to allow water evacuation

<table>
<thead>
<tr>
<th>Standard</th>
<th>Testing method</th>
<th>Systeme</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNE 10545-3</td>
<td>Length</td>
<td>448 +/- 0,2 mm</td>
</tr>
<tr>
<td>UNE 10545-3</td>
<td>Width</td>
<td>448 +/- 0,2 mm</td>
</tr>
<tr>
<td>UNE 10545-3</td>
<td>Thickness</td>
<td>21 +/- 0,2mm</td>
</tr>
<tr>
<td>UNE 10545-3</td>
<td>Water absorption</td>
<td>0,18%</td>
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<tr>
<td>UNE 10545-4</td>
<td>Breaking strength</td>
<td>3,53 kN</td>
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<td>UNE 10545-4</td>
<td>Deflection</td>
<td>4,2 mm</td>
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<tr>
<td>UNE 10545-8</td>
<td>Linear thermal expansion</td>
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<td>UNE 51310</td>
<td>Shore hardness polyurethane</td>
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<tr>
<td>UNE 51310</td>
<td>Density (Polyurethane)</td>
<td>1210 kg/m³</td>
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</tbody>
</table>
Components

- Cli-ker n exterior base
- Finishing profile
- P-404 mastic
- Joining piece
- Compensation piece
- Plug

Steps for a successful installation

Step 1: Cli-ker n exterior is a system that adapts to the existing slopes. We recommend that the slope lines be marked to make installation easier, and to redefine the surface. Start installation from the lowest point.

Step 2: The tiles must be cut using a tile cutter or a radial saw. To install the cut pieces, use the bases instead of the joining pieces. Glue the base to the back of the cli-ker piece with P-404 mastic.

Step 3: When the cli-ker n exterior system finishes against a wall, column or other obstacles that do not allow to install the joining piece, cut it with a hand saw or radial saw.

Step 4: To reduce the small level defects that might be found on the support on which we are going to install the system, lower the base of the cli-ker n exterior. In case you need to slightly raise the tile, place a compensation piece on the joining piece.

Step 5: The finishing pieces are stainless steel "L" profiles that will be installed over the perimeter of the surface formed by cli-ker n exterior. For installation, cut the profile to size and fit it on the edge of the cli-ker n exterior.

Step 6: The finishing profile must be glued to the cli-ker n exterior piece with P-404 mastic.

Step 7: To allow for water evacuation, the profile must not cover the full length of the piece.
How to get a budget of a butech system?

• Come to one of our stores/distributors, where you will be attended by our professionals, who will show you the products that best suit your needs.
• To provide you with the best service, you should provide us the plans of the project and fill a study sheet customized to your product.
• Once delivered the plans and the sheet correctly completed, from the Technical Department of butech, a first budget will be done.
• In less than 15 days, the same professional who attended you will deliver the budget.
• In case of acceptance, and if you wish, you will receive the visit of one of our technicians for the preparation of the final budget.
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