COMPOSITION
Tecbor® A and B boards are rigid fine magnesium oxide, silicates, and other additives, finished with a fibreglass mesh on both sides.

TESTS
Tecbor® A and B boards are tested in official laboratories certified by ENAC or other similar international entities and pursuant to EN and ASTM standards, among others. Given our concern to make Tecbor® an integral solution, we conduct real-scale tests in tunnels, hydrocarbon curve tests, RWS curve tests or tests under the American UL standard.

FIRE REACTION
Tecbor® A and B is classified European Standard EN 13501-1.

TRACEABILITY
All of our products undergo internal quality control procedures to guarantee the history, location and path of our batches.

QUALITY
Tecbor® A and B boards bear the CE Mark [ETA 09/0057] pursuant to the specific Commitment to and effort in the creation of a market leading product, certified by BSI pursuant to standard ISO 9001.

HEALTH AND SAFETY
Tecbor® A and B boards do not contain hazardous substances, according to the Commission’s Database DS041/051.

TECHNICAL ASSISTANCE
We provide customised assistance on both building solutions and building regulations.

APPLICATION
We seek to make our products easy and quick to assemble, thus delivering the most competitive solutions in the market.
## TECHNICAL CHARACTERISTICS AND SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specifications</th>
<th>TECBOR® A</th>
<th>TECBOR® B</th>
<th>Normative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Composition</strong></td>
<td>Magnesium oxide, silicates &amp; other additives</td>
<td>Magnesite based, silicate &amp; other additives</td>
<td></td>
</tr>
<tr>
<td><strong>Fire Performance</strong></td>
<td>Non-combustible Euroclass A1</td>
<td>Non-combustible Euroclass A1</td>
<td>EN 13501-1:2002</td>
</tr>
<tr>
<td><strong>Dry Density [40°C]</strong></td>
<td>700 kg/m³ ± 10%</td>
<td>650 kg/m³ ± 10%</td>
<td>EN 12467</td>
</tr>
<tr>
<td><strong>Density [23°C and 50% HR]</strong></td>
<td>730 kg/m³ ± 10%</td>
<td>680 kg/m³ ± 10%</td>
<td>EN 12467</td>
</tr>
<tr>
<td><strong>Thermal Conductivity</strong></td>
<td>0.27 W/mk</td>
<td>0.19 W/mk</td>
<td>EN 12664</td>
</tr>
<tr>
<td><strong>Alkalinity pH</strong></td>
<td>8 - 10</td>
<td>8 - 10</td>
<td>EN 13468</td>
</tr>
<tr>
<td><strong>Water absorption capacity</strong></td>
<td>1.9 kg/m²</td>
<td>4.12 kg/m²</td>
<td>EN 1609</td>
</tr>
<tr>
<td><strong>Thermal expansion [20-100°C]</strong></td>
<td>3.6 (1/°C) * 10E-5</td>
<td>3.1 (1/°C) * 10E-5</td>
<td>EN ISO 10.545-8/97</td>
</tr>
<tr>
<td><strong>Thickness margin</strong></td>
<td>± 1 mm</td>
<td>± 2 mm / -1 mm</td>
<td>EN 12467</td>
</tr>
<tr>
<td><strong>Edge straightness</strong></td>
<td>Level I – 0.1%</td>
<td>Level I – 0.1%</td>
<td>EN 12467</td>
</tr>
<tr>
<td><strong>Organic matter content</strong></td>
<td>4.55%</td>
<td>3.30%</td>
<td>103 204/93</td>
</tr>
<tr>
<td><strong>Resistance to water erosion</strong></td>
<td>R &lt; 0.75</td>
<td>R &lt; 0.75</td>
<td>EN 12467</td>
</tr>
<tr>
<td><strong>Modulus of elasticity (MPa)</strong></td>
<td>3018.7</td>
<td>2149.2</td>
<td>EN 12089; EN 310</td>
</tr>
<tr>
<td><strong>Flexural strength MOR (MPa)</strong></td>
<td>7.2</td>
<td>3.58</td>
<td>EN - 12467</td>
</tr>
<tr>
<td><strong>Tensile strength perpendicular to fibre [MPa]</strong></td>
<td>1.2</td>
<td>0.68</td>
<td>EN - 1607</td>
</tr>
<tr>
<td><strong>Tensile strength parallel to fibre [MPa]</strong></td>
<td>1.59</td>
<td>0.81</td>
<td>EN 1608</td>
</tr>
<tr>
<td><strong>Compressive strength (MPa)</strong></td>
<td>7.07</td>
<td>4.64</td>
<td>EN - 826</td>
</tr>
<tr>
<td><strong>Dimensional stability</strong></td>
<td>≤ 0.25%</td>
<td>≤ 0.25%</td>
<td>EN 326-1</td>
</tr>
<tr>
<td><strong>Microbial proliferation</strong></td>
<td>No</td>
<td>No</td>
<td>EN 13403</td>
</tr>
<tr>
<td><strong>Life</strong></td>
<td>25 years Z₂ [indoor use]</td>
<td>25 years Z₂ [indoor use]</td>
<td>ETA 09/0057</td>
</tr>
</tbody>
</table>

Some values quoted relate to internal testing across the size range. Individual test certificates are available upon request.

We reserve the right to improve product performance at any time and without prior reference. Stricter board tolerances can be achieved to suit specific project requirements.

All data and technical parameters given in herewith catalogue were estimated and provided according to the best technical knowledge and available internal tests and expertise.

Data in details will be accompanied by relevant technical tests upon request, which tests will be carried out in laboratories and research establishments entitled to proceed such.
Steel structures are used for building purposes worldwide. One of the main advantages is that they have great resistance per weight unit, which provides them with huge versatility and the possibility of creating complex yet light structures.

However, the thermal conductivity of steel represents a disadvantage. Therefore, in the event of a fire increase in temperature plus steel high heat transmission result in a substantial reduction of the structure's bearing capacity and mechanical resistance. The resistance and elastic limit are modified above 250°C, and above roughly 500°C the drop in resistance is significant enough not to support its design capacity.

Several tests with Tecbor® have been performed pursuant to standard EN 13381-4 to determine the board's fire protection properties when applied to steel structural elements such as beams, columns or tension elements. Tecbor® has been tested to cover a great variety of steel profiles characterised by their section factors. Likewise, it has been tested for several standard specifi
The necessary board thickness for the steel structure protection depends on the A/V ratio of the steel section.

The A/V rate is a measure of the speed at which a steel section is heated during a fire. The higher section factor is the thicker the board will be for the profile.

\[
A/V (m^{-1})
\]

where \(A\) = heated perimeter in meters (m)

where \(V\) = total crossed sectional area in sqm (m²)

The information in this chart appears in the test report under file 10/1483-1014. Valid chart for 500°C design temperature on steel pursuant to ENV 13381-4.

<table>
<thead>
<tr>
<th>Section Factor (A/V)</th>
<th>30 min</th>
<th>60 min</th>
<th>90 min</th>
<th>120 min</th>
<th>180 min</th>
<th>240 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>m⁻¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>[19]</td>
<td>[19]</td>
<td>[19]</td>
<td>[19]</td>
<td>[27]</td>
<td>[38]</td>
</tr>
<tr>
<td>50</td>
<td>[19]</td>
<td>[19]</td>
<td>[19]</td>
<td>[19]</td>
<td>29</td>
<td>[40]</td>
</tr>
<tr>
<td>60</td>
<td>[19]</td>
<td>[19]</td>
<td>[19]</td>
<td>20</td>
<td>31</td>
<td>–</td>
</tr>
<tr>
<td>70</td>
<td>[19]</td>
<td>[19]</td>
<td>[19]</td>
<td>22</td>
<td>33</td>
<td>–</td>
</tr>
<tr>
<td>80</td>
<td>[19]</td>
<td>[19]</td>
<td>[19]</td>
<td>23</td>
<td>35</td>
<td>–</td>
</tr>
<tr>
<td>90</td>
<td>[19]</td>
<td>[19]</td>
<td>[19]</td>
<td>24</td>
<td>36</td>
<td>–</td>
</tr>
<tr>
<td>100</td>
<td>[19]</td>
<td>[19]</td>
<td>[19]</td>
<td>25</td>
<td>37</td>
<td>–</td>
</tr>
<tr>
<td>110</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>20</td>
<td>26</td>
<td>38</td>
</tr>
<tr>
<td>120</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>20</td>
<td>26</td>
<td>39</td>
</tr>
<tr>
<td>130</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>21</td>
<td>27</td>
<td>40</td>
</tr>
<tr>
<td>140</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>21</td>
<td>27</td>
<td>40</td>
</tr>
<tr>
<td>150</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>22</td>
<td>28</td>
<td>[41]</td>
</tr>
<tr>
<td>160</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>22</td>
<td>28</td>
<td>[41]</td>
</tr>
<tr>
<td>170</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>22</td>
<td>29</td>
<td>[42]</td>
</tr>
<tr>
<td>180</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>22</td>
<td>29</td>
<td>[42]</td>
</tr>
<tr>
<td>190</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>23</td>
<td>29</td>
<td>[42]</td>
</tr>
<tr>
<td>200</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>23</td>
<td>29</td>
<td>–</td>
</tr>
<tr>
<td>210</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>23</td>
<td>30</td>
<td>–</td>
</tr>
<tr>
<td>220</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>23</td>
<td>30</td>
<td>–</td>
</tr>
<tr>
<td>230</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>23</td>
<td>30</td>
<td>–</td>
</tr>
<tr>
<td>240</td>
<td>[19]</td>
<td>[19]</td>
<td></td>
<td>23</td>
<td>30</td>
<td>–</td>
</tr>
<tr>
<td>250</td>
<td>[19]</td>
<td>[19]</td>
<td>[24]</td>
<td>[30]</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>260</td>
<td>[19]</td>
<td>[19]</td>
<td>[24]</td>
<td>[30]</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>265</td>
<td>[19]</td>
<td>[19]</td>
<td>[24]</td>
<td>[31]</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

VALUES WITHOUT BRACKETS ARE VALUES OBTAINED DIRECTLY FROM TESTING.

VALUES IN BRACKETS COME FROM EXTRAPOLATION PERFORMED BY THE LABORATORY ACCORDING TO THE NORMATIVE.
TESTS
Standard: ENV 13381-4
Laboratory: APPLUS
Test No: 10/1483-1014

SOLUTION
1 Tecbor® boards.
2 Tecbor® B 40 mm boards.
3 Self-tapping screw (size according to board).
4 Steel column.
5 Tecbor® joint paste.
6 30x30x0.6 mm angle section.
7 45x15x0.6 mm omega.
8 5x80 mm self-tapping screw.

DESCRIPTION OF ASSEMBLY
Fix 45x15x0.6 mm omega profile’s flange
Fix 30x30x0.6 mm angle section to the Tecbor® board strips, and then the strips onto the omega profile every 250 mm. Assemble the strips.
Use Tecbor® joint paste in screw heads and between boards.

NOTE: If protection procedure is done with 40 mm Tecbor® B boards, they may be joined without auxiliaries using 5x80 mm screws every 250 mm.
1.2 – METAL STRUCTURE PROTECTION. BEAMS

TESTS
Standard: ENV 13381-4
Laboratory: APPLUS
Test No: 10/1483-1014

SOLUTION
1. Tecbor® boards.
2. Self-tapping screw (size according to board).
3. Steel beam.
4. Tecbor® joint paste.
5. 30x30x0.6 mm angle section.
6. 45x15x0.6 mm omega.
7. Slab.
8. 6x60 mm metal plug.

DESCRIPTION OF ASSEMBLY
Fix 45x15x0.6 mm omega profile's fla
the 30x30x0.6 mm angle to the slabs with 6x60 mm plugs every 300 mm.
Fix 30x30x0.6 mm lower angle section to the Tecbor® board strips
and these onto the omega profiles and onto the angle anchored to
the slabs with self-tapping screws every 250 mm.
Use Tecbor® joint paste in screw heads and between boards.
Protecting the wiring adequately will be crucial when electrical supply systems must be kept in optimal running conditions during fire. It is of paramount importance to perform orderly evacuations while basic systems keep running.

Tecbor® B 40 mm boards have been tested pursuant to general requirements in standard EN 1363-1 by covering a cable tray from different sections. Then, other tests have been run on electrical conductivity, short-circuits in cables and grounding.

Facilities may be accessed through inspection hatches. Likewise, Tecsel® Grids allowing for ventilation and sealing the hole in case of fire. For more information, please contact our Sales Department.
2.1 TECBOR® B 40 – EI-120 CABLE PROTECTION

TESTS
Standard: ENV 1363-1. UL 1709 Heating Curve
Laboratory: CIDEMCO
Test No: 25417

SOLUTION
1. Tecbor® B 40 mm boards.
2. Tecbor® B 20 mm boards.
3. M12 rod.
4. Tecbor® joint paste ready to use.
5. 50x50x5 mm angle section every 1000 mm.
6. 3.5x45 mm self-drilling screw.
7. 5.2x80 mm self-tapping screw.
8. 3.5x45 mm self-tapping screw.
9. Slab.
10. Cable tray.

DESCRIPTION OF ASSEMBLY
The tray is protected by a layer of Tecbor® B 40 mm boards set together with 5.2x80 mm self-tapping screws. At duct section joints, place a 200 mm wide board strip of 20 mm Tecbor® B and fix it to the metal tray and to each other using 3.5x45 mm screws.

The duct is anchored to the slabs with a 12 mm rod and supported by 50x50x5 mm angle sections.

Board joints and screw heads should be covered with Tecbor® joint paste ready to use.

Penetrations seals:
Fill the hole between the duct and the structural work with 50 mm and 145 kg/m³ rock wool and paint both sides with Tecbor® joint paste ready to use.
3 – Ventilation Ducts

Most of new constructions are crossed by several services such as cables, piping, ducts, ventilation ducts, etc. This uninterrupted design alters the subdivisions of the splitting elements, allowing fire and smoke to pass through different fire areas.

For ventilation ducts there are several solutions to prevent smoke and fire.

Our solution consists in providing elements with a resistance equal to or above the resistance of crossed elements.
TESTS
Standard: EN 1366-1
Laboratory: CIDEMCO
Test No: 18037-1-2/M1

SOLUTION
1. Tecbor® B 20 mm boards.
2. M16 threaded rod.
3. 40x40x2 mm angle section.
4. 3.5 x 45 mm self-drilling screw.
5. Tecbor® joint paste ready to use.
6. 50x50x5 mm L-shaped support.
7. Tecbor® B 20 mm plate to cover joints.
8. 10x100 mm metal plug.
10. 50 mm and 145 kg/m³ density rock wool.
11. 3.5x45 mm self-tapping screw.

DESCRIPTION OF ASSEMBLY
The duct comprises 2 Tecbor® B 20 mm boards. Lower layer boards are fastened through 3.5x45 mm self-tapping screws every 300 mm. Once built, the duct inner part is reinforced with 40x40x2 mm steel angle sections. The second layer of the board is fastened with 3.5x45 mm self-drilling screws directly onto the angle sections. Duct sections are connected covering the joint with 250-300 mm wide Tecbor® B 20 mm plates fastened to the duct with 3.5x45 mm self-tapping screws every 250 mm.

Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

Crossing fire sectors:
The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 20 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 3.5x45 mm self-tapping screws.
TESTS
Standard: EN 1366-1
Laboratory: APPLUS
Test No: 10/101165-131

SOLUTION

1. Tecbor® B 40 mm boards.
2. M16 threaded rod.
3. 50x50x5 mm L-shaped support.
4. Tecbor® B 40 mm plate to cover joints.
5. 5x80 mm self-tapping screw.
7. Tecbor® joint paste ready to use.

DESCRIPTION OF ASSEMBLY

Boards are fastened with 5x80 mm self-tapping screws every 250 mm. Duct sections are connected covering the joint with 250-300 mm wide Tecbor® B 40 mm plates fastened to the duct with 5x80 mm self-tapping screws every 250 mm.

The duct is supported by 50x50x5 mm horizontal angle sections and hung from the slabs with M16 rod, nut and bolt. Distance between hanging elements is 1 m. Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

Crossing fire sectors:

The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 40 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 5x80 mm self-tapping screws.
3.3 TECBOR® B 20+20 TYPE B – EI-120 HORIZONTAL DUCT

SOLUTION

1. Tecbor® B 20 mm boards.
2. M16 threaded rod.
3. 40x40x2 mm angle section.
4. 3.5x45 mm self-tapping screw.
5. Tecbor® joint paste ready to use.
6. 50x50x5 mm L-shaped support.
7. Tecbor® B 20 mm plate to cover joints.
8. M16 nut and bolt.
9. 3.5x45 mm self-drilling screw.

DESCRIPTION OF ASSEMBLY

The duct comprises 2 Tecbor® B 20 mm boards. Lower layer boards are fastened through 3.5x45 mm self-tapping screws every 300 mm. Once built, the duct inner part is reinforced with 40x40x2 mm steel angle sections. The second layer of the boards is fastened with 3.5x45 mm self-drilling screws directly onto the angle sections. Duct sections are connected covering the joint with 250-300 mm wide Tecbor® B 20 mm plates fastened to the duct with 3.5x45 mm self-tapping screws every 250 mm.

The duct is supported by 50x50x5 mm horizontal angle sections and hung from the forging by means of M16 rod, ring and bolt. Distance between hanging elements is 1 m. Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

Crossing fire sectors:

The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 20 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 3.5x45 mm self-tapping screws.
3.4 TECBOR® 40 TYPE B – EI-120 HORIZONTAL DUCT

TESTS
Standard: EN 1366-1
Laboratory: CIDEMCO
Test No: 19078-1/-2 M1

SOLUTION
1. Tecbor® B 40 mm boards.
2. 50x50x5 mm L-shaped support.
3. 50 mm and 145 kg/m³ density rock wool.
4. Tecbor® B 40 mm plate to cover joints.
5. 5x80 mm self-tapping screw.
7. M16 rod.
8. 10x100 mm metal plug.
9. Tecbor® joint paste ready to use.

DESCRIPTION OF ASSEMBLY
Boards are fastened with 5x80 mm self-tapping screws every 250 mm. Duct sections are connected covering the joint with 250-300 mm wide Tecbor® B 40 mm plates fastened to the duct with 5x80 mm self-tapping screws every 250 mm.

The duct is supported by 50x50x5 mm horizontal angle sections and hung from the slabs with M16 rod, nut and bolt. Distance between hanging elements is 1.00 m. Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

Crossing fire sectors:
The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 40 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 5x80 mm self-tapping screws.
TESTS
Standard: EN 1366-1
Laboratory: CIDEMCO
Test No: 19052-2/-3

SOLUTION
1. Tecbor® B 20 mm boards.
2. 3.5x15 mm self-tapping screw.
3. 3.5x45 mm self-tapping screw.
4. 40x40x0.6 mm angle section.
5. 3.5x45 mm self-drilling screw.
6. 40x40x2 mm angle section.
7. Tecbor® B 20 mm plate to cover joints.
8. Tecbor® joint paste ready to use.
9. 10x100 mm metal plug.
10. Masonry.

DESCRIPTION OF ASSEMBLY
The duct comprises 2 Tecbor® B 20 mm boards. Lower layer boards are fastened through 3.5 x 45 mm self-tapping screws every 300 mm. Once built, the duct inner part is reinforced with 40x40x2 mm steel angle sections. The second layer of the boards is fastened with 3.5x45 mm self-drilling screws directly onto the angle sections.

Duct sections are connected covering the joint with 250-300 mm wide Tecbor® B 20 mm plates fastened to the duct with 3.5x45 mm self-tapping screws every 250 mm. Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

Crossing fire sectors:
The space between the duct and the structural work is filled with 145 kg/m³ rock wool. Then, 250 mm wide Tecbor® B 20 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 3.5x45 mm self-tapping screws.
Tests
Standard: EN 1366-1
Laboratory: CIDEMCO
Test No: 19318-2/-3 M1

Solution

1. Tecbor® B 40 mm boards.
2. 3.5x15 mm self-tapping screw.
3. 5x80 mm self-tapping screw.
4. 40x40x0.6 mm angle section.
5. 50 mm and 145 kg/m³ density rock wool.
6. Tecbor® B 40 mm plate to cover joints.
7. Tecbor® joint paste ready to use.
8. 10x100 mm metal plug.

Description of Assembly

Boards are fastened with 5x80 mm self-tapping screws every 250 mm. Duct sections are connected covering the joint with 250-300 mm wide Tecbor® B 40 mm plates fastened to the duct with 5x80 mm self-tapping screws every 250 mm. Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

Crossing fire sectors:

The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 40 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 5x80 mm self-tapping screws.
TESTS
Standard: EN 1366-1
Laboratory: CIDEMCO
Test No: 19052-1/-3

SOLUTION
1. Tecbor® B 20 mm boards.
2. 3.5x15 mm self-tapping screw.
3. 3.5x45 mm self-tapping screw.
4. 40x40x0.6 mm angle section.
5. 3.5x45 mm self-drilling screw.
6. 40x40x2 mm angle section.
7. Tecbor® B 20 mm plate to cover joints.
8. Tecbor® joint paste ready to use.
9. 10x100 mm metal plug.
10. Masonry.
11. 50 mm and 145 kg/m³ density rock wool.

DESCRIPTION OF ASSEMBLY
The duct comprises 2 Tecbor® B 20 mm boards. Lower layer boards are fastened through 3.5 x 45 mm self-tapping screws every 300 mm. Once built, the duct inner part is reinforced with 40x40x2 mm steel angle sections. The second layer of the boards is fastened with 3.5x45 mm self-drilling screws directly onto the angle sections.

Duct sections are bonded covering the joint with 250-300 mm wide Tecbor® B 20 mm plates fastened to the duct with 3.5x45 mm self-tapping screws every 250 mm. Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

Crossing fire sectors:
The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 20 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 3.5x45 mm self-tapping screws.
TESTS
Standard: EN 1366-1
Laboratory: CIDEMCO
Test No: 19318-1-3/M1

SOLUTION
1. Tecbor® B 40 mm boards.
2. 5x80 mm self-tapping screw.
3. Tecbor® joint paste ready to use.
4. 10x100 mm metal plug.
5. Masonry.
6. Tecbor® B 40 mm plate to cover joints.

DESCRIPTION OF ASSEMBLY
Boards are fastened with 5x80 mm self-tapping screws every 250 mm. Duct sections are connected covering the joint with 250-300 mm wide Tecbor® B 40 mm plates fastened to the duct with 5x80 mm self-tapping screws every 250 mm. Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

Crossing fire sectors:
The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 40 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 5x80 mm self-tapping screws.
**DESCRIPTION OF ASSEMBLY**

The duct comprises one Tecbor® B 40 mm layer and one Tecbor® A 10 mm layer. First layer boards are fastened with 5x80 mm self-tapping screws. The 10 mm board is fixed to thefirst 3.9x35 mm screws. Duct sections are bonded covering the joint with 250-300 mm wide Tecbor® B 40 mm plates fastened to the duct with 5x80 mm self-tapping screws every 250 mm.

The duct is supported by 50x50x5 mm horizontal angle sections and hung from the slabs with M16 rod, nut and bolt. Distance between hanging elements is 1 m.

Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

**Crossing fire sectors:**

The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 40 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 5x80 mm self-tapping screws.

**SOLUTION**

1. Tecbor® B 40 mm boards.
2. Tecbor® A 10 mm boards.
3. 5x80 mm self-tapping screw.
4. 3.9x35 mm self-tapping screw.
5. 50x50x5 mm angle section.
6. 50 mm and 145 kg/m³ density rock wool.
7. Tecbor® B 40 mm plate to cover joints.
8. Tecbor® joint paste ready to use.
9. 10x100 mm metal plug.
10. Masonry.
11. M16 rod.

**TESTS**

Standard: EN 1366-1
Laboratory: CIDEMCO
Test No: 20529
**TESTS**

Standard: EN 1366-1  
Laboratory: CIDEMCO  
Test No: 19967

**SOLUTION**

1. Tecbor® B 40 mm boards.  
2. Tecbor® A 10 mm boards.  
3. 5x80 mm self-tapping screw.  
4. 3.9x35 mm self-tapping screw.  
5. 50x50x5 mm angle section.  
6. 50 mm and 145 kg/m³ density rock wool.  
7. Tecbor® B 40 mm plate to cover joints.  
8. Tecbor® joint paste ready to use.  
9. M16 rod and nut.

**DESCRIPTION OF ASSEMBLY**

The duct comprises one Tecbor® B 40 mm layer and one Tecbor® A 10 mm layer. First layer boards are fastened with 5x80 mm self-tapping screws. The 10 mm board is fixed to the first layer with 3.9x35 mm screws. Duct sections are connected covering the joint with 250-300 mm wide Tecbor® B 40 mm plates fastened to the duct with 5x80 mm self-tapping screws every 250 mm.

The duct is supported by 50x50x5 mm horizontal angle sections and hung from the slabs by means of M16 rod, washer and bolt. Distance between hanging elements is 1 m.

Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

**Crossing fire sectors:**

The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 40 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 5x80 mm self-tapping screws.
3.11 TECBOR® 40+10 TYPE A – EI-180 VERTICAL DUCT

TESTS
Standard: EN 1366-1
Laboratory: CIDEMCO
Test No: 19966 M1

SOLUTION
1. Tecbor® B 40 mm boards.
2. Tecbor® A 10 mm boards.
3. 5x80 mm self-tapping screw.
4. 3.9x35 mm self-tapping screw.
5. 40x40x0.6 mm angle section.
6. 50 mm and 145 kg/m³ density rock wool.
7. Tecbor® B 40 mm plate to cover joints.
8. Tecbor® joint paste ready to use.
9. 10x100 mm metal plug.
10. Masonry.

DESCRIPTION OF ASSEMBLY
The duct comprises one Tecbor® B 40 mm layer and one Tecbor® A 10 mm layer. First layer boards are fastened with 5x80 mm self-tapping screws. The 10 mm board is fixed to the first layer with 3.9x35 mm screws.

Duct sections are connected covering the joint with 250-300 mm wide Tecbor® B 40 mm plates fastened to the duct with 5x80 mm self-tapping screws every 250 mm. Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

Crossing fi
The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 40 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 5x80 mm self-tapping screws.
SOLUTION

1. Tecbor® B 40 mm boards.
2. Tecbor® A 10 mm boards.
3. 5x80 mm self-tapping screw.
4. 3.9x35 mm self-tapping screw.
5. 40x40x0.6 mm angle section.
6. 50 mm and 145 kg/m³ density rock wool.
7. Tecbor® B 40 mm plate to cover joints.
8. Tecbor® joint paste ready to use.
9. 10x100 mm metal plug.
10. Masonry.

DESCRIPTION OF ASSEMBLY

The duct comprises one Tecbor® B 40 mm layer and one Tecbor® A 10 mm layer. First layer boards are fastened with 5x80 mm self-tapping screws. The 10 mm board is fixed to the first layer with 3.9x35 mm screws.

Duct sections are connected covering the joint with 250-300 mm wide Tecbor® B 40 mm plates fastened to the duct with 5x80 mm self-tapping screws every 250 mm. Joints between boards, other joints and screw heads should be sealed with Tecbor® joint paste ready to use.

Crossing fire sectors:

The space between the duct and the structural work is filled with rock wool 145 kg/m³ density. Then, 250 mm wide Tecbor® B 40 mm board strips are placed around the duct and anchored to the structural work with 10x100 mm plugs on both sides. Afterwards, a ring surrounding the duct is made with 250 mm strips fastened with 5x80 mm self-tapping screws.
1. 3-sided horizontal duct.

2. 2-sided horizontal duct.

3. Section changes.

4. Dislevelment.

5. Elbow-shaped elements.


7. Vertical anchor and horizontal coupling.

8. 3-sided vertical duct.

9. 2-sided vertical duct.

* For building details on connections, please contact the Sales Department.
Non-structural walls, which separate fire areas, should be fire resistant as stipulated in standard EN 1364-1.

When in fire edge is left free (Part 1: Walls), the standard allows increasing the width. With regard to increasing the height, the standard is clear and precise. When the test is run at least at 3 metres high, it may be increased up to 4 metres.

Very often, internal partitions are higher than 4 metres. We have been the fire the most effi works. Besides, penetrations produced between different fire sectors must be sealed off; for example, in the case of crossing installations.
### TEST

Standard: UNE EN 1364-1  
Laboratory: TECNALIA  
Test N°: 051497-1

### DESCRIPTION OF ASSEMBLY

Fix 73x30x0.5 mm runners with M6 metal plug every 250-300 mm. Finish off the metal structure with 70x36x0.6 mm double studs arranged in “H” position with a 610 mm inter-axial distance.

Then fix Tecbor® A 12 mm boards to both sides with 3.5x35 mm self-tapping screws every 200-250 mm.

Finally, cover board joints and screw heads with Tecbor® joint paste.

The metal studs shall be covered with some Tecbor® board strips, on which the boards will be screwed on.

---

### SOLUTION

1. Tecbor® A 12 mm boards.  
2. 70x36x0.6 mm double metal stud H-shaped.  
3. 73x30x0.5 mm metal runner.  
4. 3.5x35 mm self-tapping screw.  
5. M6 metal plug.  
6. Tecbor® joint paste.
4.1 TECBOR® A 12 – EI-120 PARTITION

TESTS
Standard: EN 1364-1
Laboratory: CIDEMCO
Test No: 17826-1/-2 M1

SOLUTION
1. Tecbor® A 12 mm boards.
2. 70x36x0.6 mm double metal stud H-shaped.
3. 70 mm (40+30) and 100 kg/m³ density rock wool.
4. 73x30x0.5 mm metal runner.
5. 3.5x35 mm self-tapping screw.
6. M6 metal plug.
7. Tecbor® joint paste.

DESCRIPTION OF ASSEMBLY
Fix 73x30x0.5 mm runners with M6 metal plug every 250-300 mm. Finish off the metal structure with 70x36x0.6 mm double studs arranged in "H" position with a 610 mm inter-axial distance. Place rock wool panels between studs. Then fix Tecbor® A 12 mm boards to both sides with 3.5x35 mm self-tapping screws every 200-250 mm. Finally, cover board joints and screw heads with Tecbor® joint paste.
4.2 TECBOR® A 10+10 – EI-180 PARTITION

TESTS
Standard: EN 1364-1
Laboratory: CIDEMCO
Test No: 16876-1/-2 M1

SOLUTION
1 Tecbor® A 10 mm boards.
2 70x36x0.6 mm double stud H-shaped.
3 60 mm [30+30] and 100 kg/m³ density rock wool.
4 73x30x0.5 mm runner.
5 3.5x35 mm self-tapping screw.
6 M6 metal plug.
7 Tecbor® joint paste.

DESCRIPTION OF ASSEMBLY
Fix 73x30x0.5 mm runners with M6 metal plug every 250-300 mm. Finish off the metal structure with 70x36x0.5 mm double studs arranged in “H” position with a 610 mm inter-axial distance. Place rock wool panels between studs. Then fix the two layers of Tecbor® A 10 mm boards to both sides with 3.5x35 mm self-tapping screws every 200-250 mm, overlapping boards of each layer. Finally, cover board joints and screw heads with Tecbor® joint paste.
4.3 TECBOR® A 10 – EI-120 PANEL ON CONCRETE BLOCK

TESTS
Standard: EN 1364-1
Laboratory: CIDEMCO
Test No: 14736-1/-2 M1

SOLUTION
1. Tecbor® A 10 mm boards.
2. 15x45x0.5 mm omega sections.
3. 5x65 mm umbrella type metal plug.
4. Tecbor® joint paste.
5. 3.5x25 mm self-drilling screw.
6. Concrete block wall.

DESCRIPTION OF ASSEMBLY
On a 15 cm hollow concrete block, attach the 15x45x0.5 mm omega metal profiles every 610 mm using umbrella-type 5x65 mm anchors. Then fix Tecbor® A 10 mm boards with 3.5x25 mm self-drilling screws. Use Tecbor® joint paste in screw heads and between boards. Distance between screws should be 250-300 mm approximately.
4.4 TECBOR® A 12 – EI-180 WALL LINING ON PRECAST CONCRETE BLOCK

TESTS
Standard: EN 1364-1
Laboratory: CIDEMC0
Test No: 16149-1/-2 M1

SOLUTION
1. Tecbor® A 12 mm boards.
2. 15x45x0.5 mm omega sections.
3. 5x65 mm metal plug.
4. Tecbor® joint paste.
5. 3.5x25 mm self-drilling screw.

DESCRIPTION OF ASSEMBLY
On a 12 cm precast concrete wall, attach the 15x45x0.5 mm omega metal profi anchors. Then fi A 12 mm boards with 3.5x25 mm self-drilling screws. Use Tecbor® joint paste in screw heads and between boards. Distance between screws should be 250-300 mm approximately.
**4.5 TECBORB® A 12 – EI-240 WALL LINING ON CERAMIC BRICKWORK**

**TESTS**

Standard: EN 1364-1  
Laboratory: APPLUS  
Test No: 07/32302900

**SOLUTION**

1. Tecbor® A 12 mm boards.  
2. 15x45x0.5 mm omega sections.  
3. 10x60 mm anchor.  
4. Tecbor® joint paste.  
5. 3.5x25 mm self-drilling screw.  
6. ≥ 2.3 cm ceramic brick wall.  
7. 10 mm plastering.

**DESCRIPTION OF ASSEMBLY**

On a 12 cm ceramic brick wall with 10 mm plastering on the unexposed side, attach 15x45x0.5 mm omega metal profile 610 mm using 10x60 mm anchors. Then fit Tecbor® A 12 mm boards with 3.5x25 mm self-drilling screws. Use Tecbor® joint paste in screw heads and between boards. Distance between screws should be 250-300 mm approximately.
4.6 TECBOR® A 12+12 – EI-90 INDEPENDENT WALL LINING

TESTS
Standard: EN 1364-1
Laboratory: CIDEMCO
Test No: 19216-1/-2 M1

SOLUTION
1. Tecbor® A 12 mm boards.
2. 70x36x0.6 mm H-shaped stud.
3. 60 mm [30+30] and 100 kg/m³ density rock wool.
4. 73x30x0.5 mm runner.
5. 3.5x35 mm self-tapping screw.
6. Tecbor® joint paste.
7. Steel profi

DESCRIPTION OF ASSEMBLY
Attach 73x30x0.5 mm runners and assemble 70x36x0.6 mm studs every 610 mm. Fill in frame with 60 mm [30+30 mm] and 100 kg/m³ rock wool panels.

Attach both Tecbor® A 12 mm board layers with 3.5x35 mm self-tapping screws every 200-250 mm alternating the layers. Use Tecbor® joint paste in screw heads and between boards.

Upon running the test, a 0.6 mm thick galvanised sheet was mounted on the unexposed surface, fixed with sheet-metal screws. This sheet is not fixed but can be replaced in the final assembly. An IPN 140 metal profil was placed in the test furnace frame centre.
4.7 TECBOR® A 15+15 – EI-120 INDEPENDENT WALL LINING

TESTS
Standard: EN 1364-1
Laboratory: CIDEMCO
Test No: 19319-1/-2 M1

SOLUTION
1. Tecbor® A 15 mm boards.
2. 70x36x0.6 mm double stud H-shaped.
3. 60 mm (30+30 mm) and 100 kg/m³ density rock wool.
4. 73x30x0.5 mm runner.
5. 3.5x35 mm self-tapping screw.
6. Tecbor® joint paste.
7. Metal profile.

DESCRIPTION OF ASSEMBLY
Attach 73x30x0.5 mm runners and assemble 70x36x0.6 mm studs every 610 mm. Fill in frame with 60 mm [30+30 mm] and 100 kg/m³ rock wool panels. Attach both Tecbor® A 15 mm board layers with 3.5x35 mm self-tapping screws every 200-250 mm alternating the layers.

Use Tecbor® joint paste in screw heads and between boards.

Upon running the test, a 0.6 mm thick galvanised sheet was mounted on the unexposed surface, fixed with sheet-metal screws. This sheet is not fixed and can be replaced in the future. It was placed in the test furnace frame centre.
If partitions are above 4 m high, additional reinforcement must be provided.

This structural solution consists of 5 easy-to-install pieces protecting the partition against the stress caused by dilation and temperature variations, and the masonry seating itself.

1. System scheme

The structural solution includes 5 standard pieces, assembled as shown in the picture.

Pieces no.3 have four slot holes; therefore, they are attached to the substrate with metal plugs or anchors. Such slot holes allow the partition to move perpendicularly in case of deformation.

The rest of the pieces are assembled as shown in the picture following standard dimensions, except for the last section where pieces no.5 will be cut 100mm less than the required size to allow for the absorption of movements due to dilation/expansion.
2. System assembly and details

The mesh-shaped structure has the size indicated in the diagram and includes independent areas of 8.41 m² (formed by 3 Tecbor® boards each). Piece no. 4 represents the crossbeam and piece no. 5 the main stud.

Piece no. 2 is a three point connection used to join pieces 4 and 5 on the partition end edge.

Once the primary metal structure is placed, the secondary framing (runners and studs) will be mounted on said structure. Runners and studs are fixed by nails placed at a distance of 250-300 mm.

Tecbor® boards are fixed to the secondary sections (runners and studs) and never to the metal structure using Hi-lo screws (sized according to partition used).
METALWORK ASSEMBLY FOR LARGE PARTITIONS (> 4 m high)

DETAILED VIEW (DA)

PIECE NO. 1
PIECE NO. 4
RUNNER
STUD

DETAILED VIEW (DB)

PIECE NO. 2
PIECE NO. 4
RUNNER
STUD

DETAILED VIEW (DC)

PIECE NO. 3
RUNNER
STUD
METAL PLUG

DETAILED VIEW (DD)

PIECE NO. 3
CLEARANCE
PIECE NO. 5
RUNNER
3. Tecbor® boards

Tecsel® Intumescent Mastic for indoor use will be applied on 2 mm joints between 8.41 m² boards sections. Tecsel® Intumescent Mastic will absorb any inter-board dilation.

A free edge of about 50-70 mm will be left on top of the partition (according to partition’s size) to enable it to move in harmony with the structural work. This edge will be sealed off using either an outer 100 mm wide skirting board or Tecsel® Intumescent Mastic.

For additional information, please contact our Technical Department.
5 – Suspended Ceilings and Slabs Protection

Fireproof suspended ceilings are used mainly in two specific cases.

The first case is to isolate different fire areas. This action helps restrain fire propagation to other areas. This solution is highly useful in the case of high-rises since partial sector division might cause the fire during evacuation.

The second case is to protect the various objects found above the ceiling; for example, installations, structures, slabs, etc. According to our requirements, we shall use either application. Our solutions have been tested when fire occurs.
5.1 Tecbor® A 12+12 – EI-120 INDEPENDENT SUSPENDED CEILING

**DESCRIPTION OF ASSEMBLY**

Fix 48x30x0.5 mm runners with 10x100 mm plugs every 500 mm approximately around the ceiling’s perimeter.

Then install TC 60/27 profi axes placing such sections crosswise through a steel grip for TC 60/27 forming 610x610 mm frames. Using the steel grips, the M6 rod and the clamps, fit ceiling.

Once the metal structure is fitted base-boards to the fitted rock wool above the structure. Then, place the second board layer using 3.5x45 mm self-tapping screws alternating it with the first layer.

Use Tecbor® 12 mm to fit base-board.

Distance between screws will be approximately 250-300 mm. Screw heads and inter-board joints will be covered with Tecbor® joint paste.

**TESTS**

Standard: EN 1364-2
Laboratory: CIDEMCO
Test No: 20331-1/-2-a-M2

**SOLUTION**

1. Tecbor® A 12 mm boards.
2. 3.5x45 mm self-tapping screw.
3. 40 mm and 40 kg/m³ density rock wool.
4. Steel grip for TC 60/27.
5. M6 threaded rod.
6. Sinard type clamp.
7. TC 60/27.
8. Steel grip for TC 60/27.
10. 48x30x0.5 mm runner.
11. 10x100 mm metal plug.
12. Metal profi

**VERTICAL VIEW**

**FASTENING TO VERTICAL FACE**
TESTS
Standard: EN 1365-2
Laboratory: APPLUS
Test No: 10/1483-1009

SOLUTION
1 Tecbor® A 12 mm boards.
2 3.5x35 mm self-tapping screw.
3 40 mm and 70 kg/m³ density rock wool.
4 Steel grip for TC 60/27.
5 M6 threaded rod.
6 Sinard type clamp.
7 TC 60/27.
8 Ribbed sheet e=0.6 mm.
9 48x30x0.5 mm runner
10 10x100 mm metal plug.
11 IPE-140 metal profile.
12 46x36x0.6 mm double H-shaped stud.
13 2.9x13 mm “MM” self-drilling screw.
14 Tecbor® joint paste.

DESCRIPTION OF ASSEMBLY
Fix 48x30x0.5 mm runners with 10x100 mm plugs every 500 mm approximately around the ceiling’s perimeter. Next place profile made up of 2 46x36x0.6 mm studs arranged in “H” position lying down. Put the rock wool panels in between. Studs are fixed to TC 60/27 profiles by the upper part and suspended from the slabs through a hanging system including a Steel grip, an M6 rod and clamps every 600 mm approximately. Inter-section joints are connected through 2.9x13 mm metal/metal self-drilling screws.

Then Tecbor® A 12 mm boards are fixed every 250-300 mm. The work is completed with a 150 mm baseboard of Tecbor® A 12 mm placed all around the perimeter.

Distance between screws will be approximately 250-300 mm. Screw heads and inter-board joints will be covered with Tecbor® joint paste. On top of the suspended ceiling and the IPE 140 metal profiles a 0.6 mm thick ribbed sheet was placed at 400 mm.
5.3 TECBOR® A 12+12 – EI-90 FIREPROOF SUSPENDED CEILING

DESCRIPTION OF ASSEMBLY

Fix 73x30x0.5 mm runners with 10x100 mm plugs every 500 mm approximately around the ceiling’s perimeter. Then install TC 60/27 profi sections crosswise through a Steel grip for TC 60/27 forming 610x610 mm frames. Using the steel grip, the M6 rod and the clamps, fi

Attach both Tecbor®A 12 mm board layers with 3.5x45 mm self-tapping screws. Then alternate the second Tecbor®A board with the first one.

Use Tecbor®A 12 mm to fi wide base-board around the perimeter. Distance between screws will be approximately 250-300 mm. Screw heads and inter-board joints will be covered with Tecbor® joint paste. On top of the suspended ceiling and the IPE 160 metal profiles a 0.6 mm thick ribbed sheet was placed at 550 mm.

TESTS
Standard: EN 1365-2
Laboratory: APPLUS
Test No: 10/1483-1010

SOLUTION
1. Tecbor® A 12 mm boards.
2. 3.5x45 mm self-tapping screw.
3. Metal sheet e=0.6 mm.
4. Steel grip for TC 60/27.
5. M6 threaded rod.
6. Sinard type clamp.
7. TC 60/27.
8. Steel grip for TC 60/27.
9. 73x30x0.5 mm runner.
10. 10x100 mm metal plug.
11. IPE-160 metal profile.
12. TECBOR® joint paste.
TESTS
Standard: EN 1365-2
Laboratory: APPLUS
Test No: 10/1483-1011

SOLUTION
1. Tecbor® A 15 mm boards.
2. 3.5x45 mm self-tapping screw.
3. Metal sheet e=0.6 mm.
4. Steel grip for TC 60/27.
5. M6 threaded rod.
6. Sinard type clamp.
7. TC 60/27.
8. Steel grip for TC 60/27.
9. 73x30x0.5 mm runner.
10. 10x100 mm metal plug.
11. IPE-140 metal profile.

DESCRIPTION OF ASSEMBLY
Fix 73x30x0.5 mm runners with 10x100 mm plugs every 500 mm approximately around the ceiling’s perimeter. Then install TC 60/27 profiles crosswise through a Steel grip for TC 60/27 forming 610x610 mm frames. Using the steel grip, the M6 rod and the clamps, fi

Attach both Tecbor® A 15 mm board layers with 3.5x45 mm self-tapping screws. Then alternate the second Tecbor® A board with the first one.

Use Tecbor® 15 mm to fi

wide base-board around the perimeter. Distance between screws will be approximately 250-300 mm. Screw heads and inter-board joints will be covered with Tecbor® joint paste. On top of the suspended ceiling and the IPE 160 metal profiles a 0.6 mm thick ribbed sheet was placed at 550 mm.
Catastrophes affecting high-rises have shown the importance of protecting and anchoring joints between both slabs and facades. Otherwise, existing holes between curtain walls and light facades can work as true chimneys in case of fire, causing it to spread into higher areas in the building, and thus hampering an orderly evacuation procedure.

The manifold and various confi...
TESTS
Standard: EN 1364-4
Laboratory: CIDEMCO
Test No: 22100-1/-2-a-M1

SOLUTION
1. Tecbor® B 20 mm boards.
2. 70x70x1 mm metal angle.
3. 3.5x45 mm self-tapping screw.
4. 10x100 mm metal plug.
5. Slabs.
6. Tecbor® B 20 mm plate to cover joints.

DESCRIPTION OF ASSEMBLY
Fix the 70x70x1 mm supporting angle lengthways to the Tecbor® B 20 mm board using 3.5x45mm self-tapping screws every 250-300 mm approximately. Place the angle right next to the slab edge using a 10x100 mm plug every 250-300 mm approximately. Then place Tecbor® B 20 mm plates 200-250 mm wide on the lower end of the slabs using a 10x100 plug.

Tecbor® B 20 mm plates 200 a 250 mm wide are fixed the lower end of the curtain wall using 3.5x45 mm self-tapping screws. Then Tecbor® joint paste is applied to all screw heads and between boards.
**Tests**

Standard: EN 1364-1
Laboratory: CIDEMCO
Test No: 18598-1/-2 M1

**Solution**

1. Tecbor® B 20 mm boards.
2. 48x30x0.5 mm metal runner.
3. 3.5x35 mm self-tapping screw.
4. 10x60 mm metal plug.
5. Slabs.
6. 46x36x0.6 mm metal stud.
7. 13 mm plasterboard panel.

**Description of Assembly**

Attach a 48x30x0.5 mm metal runner to the slab using a 10x60 mm metal plug. Then place the 46x36x0.6 mm studs at a distance of 610 mm between axes. Fix the Tecbor® B 20 mm boards to the structure with 3.5x35 mm screws.

Apply Tecbor® joint paste to screw heads and between boards. Finally, a 13 mm plasterboard panel is fixed inside using 3.5x35 mm self-tapping screws.

Two confi lower curtain wall to meet works requirements as appropriate.
**SOLUTION**

1. Tecbor® A 10 mm boards.
2. 60 mm (30+30) and 100 kg/m³ density rock wool.
3. Facade.
4. 50 mm and 145 kg/m³ density rock wool.
5. Facade supporting metal angle.
7. 70x36x0.6 mm metal stud.
8. External Facade (glass).
9. 3.5x25 mm self-drilling screw.

**DESCRIPTION OF ASSEMBLY**

Place 145 kg/m³ density rock wool between facade’s metal studs. Once fixed, 500 A 10 mm boards to metal studs using 3.5x25 mm self-tapping screws.

Close joint between slab and module with a Tecbor® A board 10 mm thick attached to the lower end of slab with 10x100 mm plugs every 250 mm. Apply Tecbor® joint paste to seal board joints and the sheet structure at the junction, as well as the screw heads. The gap between the slab and the module is filled with 145 kg/m³ rock wool waste.
In the last years, due to effective structural integrity.

Our purpose is to guarantee people’s safety by ensuring tunnel stability and integrity, ultimately increasing the time needed for evacuation.

Currently the EU has established within its territory the European Directive 2004/54/EC.

Tunnel experts must work on the basis of procedures taken from different countries and protocols such as the German RABT- ZTV or the Dutch RWS standards. The latter is known worldwide.

We provide tunnel protection solutions based on the Dutch RWS standard, which describes a higher temperature spike in its heating curve, thus enabling our solutions to cover the worst possible conditions in case of fire.
7.1 TECBOR® B 20+20 CONCRETE PROTECTION INSIDE TUNNEL

TESTS
Laboratory: Tunnel Safety Testing S.A. (TST)
Test No: Real Test1

SOLUTION
1. Tecbor® B 20 mm boards.
2. 15x45x0.5 mm Omega.
3. Slab.
4. 3.5x45 mm self-tapping screws.
5. 4.2x55 mm self-tapping screws.
6. 8x46 mm metal anchors.
7. 8x76 mm metal anchors.
8. Tecbor® joint paste.

DESCRIPTION OF ASSEMBLY
The ceiling is protected with 2 Tecbor® B 20 mm boards. First, attach 15x45x0.5 mm omega metal profiles every 610 mm, directly to concrete slab using an 8x46 mm metal anchor. Then attach the first Tecbor® B 20 mm board with the 3.5x45 mm self-tapping screws. The second Tecbor® B 20 mm board is fixed with 4.2x55 mm self-tapping screws.

Walls are protected using Tecbor® B 20 mm boards anchored directly to the concrete. To fix the first board, use 8x46 mm metal anchors. For the second board, use 8x76 mm metal anchors. Apply Tecbor® paste to joints between boards, both in the ceiling and the walls.
TESTS
Laboratory: CIDEMCO
Test No: 17566-1/-2-a-M1

SOLUTION
1. Tecbor® B 20 mm boards.
2. 120 mm thick slab.
3. 10x60 mm metal plug.
4. Tecbor® joint paste.

DESCRIPTION OF ASSEMBLY
Attach Tecbor® B 20 mm board directly to concrete slab using a 10x60 mm metal plug. Apply Tecbor® paste to joints between boards, both in the ceiling and the walls.
7.3 Tecbor® B 40 – EI-120 and EI-180 Tunnel Suspended Ceiling on Metal Structure

EI-120

**TESTS**
Standard: RWS Fire Curve
Laboratory: EFECTIS
Test No: 2009-Efectis-R0998

**SOLUTION**
1. Tecbor® B 40 mm boards.
2. Slabs.
3. Concrete wall.
4. Metal profile

EI-180

**TESTS**
Standard: RWS Fire Curve
Laboratory: EFECTIS
Test No: 2009-Efectis-R0999

**SOLUTION**
1. Tecbor® B 40 mm boards.
2. Slabs.
3. Concrete wall.
4. Metal profile
**7.3 TECBOR® B 40 – EI-120 AND EI-180 TUNNEL SUSPENDED CEILING ON METAL STRUCTURE**

**SOLUTION 1**
1. Tecbor® B 40 mm boards.
2. Expanding metal anchor with inner thread.
3. Steel threaded rod Ø 12 mm.
4. Zinc coated nut Ø 12 mm.
5. 75x46x1.2 mm metal profile.
6. 75x40x1.2 mm metal profile.
7. 5.5x73 mm screw.
8. Plug anchoring + 10x100 mm screw.

**DESCRIPTION OF ASSEMBLY**
Install the metal structure that will support the suspended ceiling forming a grid (refer to Technical Department for sizes) with primary profi 75x40x1.2 mm respectively.

Once the metal structure is in place, attach the Tecbor® B 40 mm board to it using 5.5x73 mm self-drilling screws. Apply Tecsel® Intumescent Mastic for joints.

For different assembly options please contact the Technical Department.

**SOLUTION 2**
1. Tecbor®B 40 mm boards for tunnel.
2. Expanding metal anchor with inner thread.
3. Steel threaded rod Ø 12 mm.
4. Zinc coated nut Ø 12 mm.
5. 75x46x1.2 mm metal profile.
6. Tecbor® A 12 mm boards.
7. 6.3x65 mm screw.
8. 4.5x50 mm Hi-Low screw.

**DESCRIPTION OF ASSEMBLY**
Install the metal structure that will support the suspended ceiling forming a grid (refer to Technical Department for sizes) using primary profi replaced with a strip of Tecbor® A 12 mm board 150 mm wide.

Once the metal structure is in place, attach the Tecbor® B 40 mm board to it using 6.3x65 mm self-drilling screws.

For different assembly options please contact the Technical Department.
**7.3 TECBOR® B 40 – EI-120 AND EI-180 TUNNEL SUSPENDED CEILING ON METAL STRUCTURE**

**SOLUTION 3**

1. Tecbor® B 40 mm boards.
2. Metal runner for anchoring.
3. Steel threaded rod Ø 12 mm.
4. Zinc coated nut Ø 12 mm.
5. 80x40x1.5 mm primary profile.
6. 80x40x1.5 mm secondary profile.
7. 6.3x65 mm screw.
8. Clamp support.
10. Concrete slab.

**DESCRIPTION OF ASSEMBLY**

Install the metal structure that will support the suspended ceiling forming a grid (refer to Technical Department for sizes) with primary profile and 75x40x1.2 mm respectively. Secondary profile on primary one without fixing since the secondary profile is mobile, thus allowing to correct any flaws in the joints. Once the metal structure is in place, attach the Tecbor® B 40 mm board to it using 6.3x65 mm self-drilling screws.

For different assembly options please contact the Technical Department.

**SOLUTION 4**

1. Tecbor® B 40 mm boards.
2. Expanding metal anchor with inner thread Ø 12 mm.
3. Steel threaded rod Ø 12 mm.
4. Zinc coated nut Ø 12 mm.
5. Pivot TC-60 Steel grip, e= 0.6 mm.
6. TC-60 connection.
7. 5x80 mm screw.
8. Plug anchoring + 10x100 mm screw.
10. Concrete slab.
11. TC 60/27 profi

**DESCRIPTION OF ASSEMBLY**

Install the metal structure that will support the suspended ceiling forming a grid (refer to Technical Department for sizes) with a TC 60/27 profi the Tecbor® B 40 mm board to it using 5.5x73 mm self-drilling screws.

For different assembly options please contact the Technical Department.
TESTS
Standard: RWS Fire Curve.
Laboratory: EFECTIS
Test No: 2011-Efectis-R0386

SOLUTION
1. Tecbor® B 30 mm boards.
2. Concrete slab.
3. Min. M6x85 metal anchor.
4. Tecsel intumescent mastic.

DESCRIPTION OF ASSEMBLY
Attach Tecbor® B 30 mm board directly to concrete slab using a M6x85 mm metal anchor. Apply Tecsel intumescent mastic to joints when required, both in the ceiling and the walls.
TESTS
Standard: RWS Fire Curve.
Laboratory: EFECTIS
Test No: 2011-Effectis-R0280

SOLUTION
1. Tecbor® B 40 mm boards.
2. Concrete slab.
3. Min. M6x90 metal anchor.
4. Tecsel intumescent mastic.

DESCRIPTION OF ASSEMBLY
Attach Tecbor® B 40 mm board directly to concrete slab using a M6x90 mm metal anchor. Apply Tecsel intumescent mastic to joints when required, both in the ceiling and the walls.
TECWOOL®

GENERAL CHARACTERISTICS OF OUR MORTARS

COMPOSITION
Tecwool® mortars, manufactured by mercor tecresa®, are a combination of rock wool with cement as unique hydraulic binder and other additives in smaller amounts added during production.

TESTS
Mercor tecresa® constantly evolves and adapts to changes in standards, developing new tests in official labs certified by ENAC or other similar international entities and pursuant to UNE EN, ASTM, etc. Our comprehensive mortar development concern leads us to real scale tests in tunnels, improved hydrocarbons curve, RWS curve or American UL standard tests.

FIRE REACTION

TRACEABILITY
All of our products undergo an internal quality control that provides a guaranteed knowledge of the history, location and path of our batches.

QUALITY
Commitment to and effort in the creation of a market leading product, certified by Applus pursuant to standard ISO 9001.

HEALTH AND SAFETY
Tecwool® is manufactured with inorganic components such as rock wool, classified according to European Directive 67/548/EEC as Xi; R-38 (health risk-free). Likewise, it is neither toxic nor pathogenic; it contains no free asbestos or crystalline silica; and it is not affected by fungi growth.

TECHNICAL ASSISTANCE
Our sales department, through its technicians, offers personalized advice both constructive solutions as implementing Normative.

FINISHINGS
Rugged or smooth finishing can be obtained due to the product’s versatility. An acrylic coating can be applied over the mortar to obtain a decorative finishing.

APPLICATION
Tecwool is applied a by pneumatic spraying machine. Easy, quick and economic.

GLOBALIZATION
Either directly or through the Group Mercor® brands, Tecresa markets its products all around the world, with the purpose of being the reference point in the passive fire protection market.
Tecwool® F is a rock wool and cement spread mortar, manufactured by mercortecresa® specifically engineered for fire protection of all types of building structures and faces.

Several reaction and resistance tests, performed in official labs, present Tecwool® F as the perfect complement for making a construction element fire resistant. Tecwool® F adapts to a wide variety of supports, even when exposed to settlement vibrations or movements. No cracking or crazing as a result of its perfect adherence and flexibility.

Besides providing great fire resistance, Tecwool® F features exceptional characteristics regarding sound and acoustic absorption in reverberation room.

Lastly, the mortar acts as an excellent thermal insulator thanks to its thermal conductivity value.
**TECHNICAL CHARACTERISTICS AND SPECIFICATIONS**

<table>
<thead>
<tr>
<th><strong>Composition</strong></th>
<th>Cement, rock wool and additives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fire reaction</strong></td>
<td>Fireproof/Euroclass A1</td>
</tr>
<tr>
<td><strong>Bulk mortar density</strong></td>
<td>250 Kg/m³ ± 10%</td>
</tr>
<tr>
<td><strong>Hardened mortar apparent density</strong></td>
<td>328 Kg/m³ ± 10%</td>
</tr>
<tr>
<td><strong>Fresh mortar apparent density</strong></td>
<td>464 Kg/m³ ± 10%</td>
</tr>
<tr>
<td><strong>Thermal conductivity</strong></td>
<td>0.061 W/mk</td>
</tr>
<tr>
<td><strong>Alkalinity (ph value)</strong></td>
<td>12.4</td>
</tr>
<tr>
<td><strong>Bulk product, dried at 105°C</strong></td>
<td>0.68% de H₂O</td>
</tr>
<tr>
<td><strong>Steam permeability</strong></td>
<td>2.1 (μ)</td>
</tr>
<tr>
<td><strong>Resistance to fungi</strong></td>
<td>Immune</td>
</tr>
<tr>
<td><strong>Protection against steel corrosion</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Flexural strength</strong></td>
<td>0.15 Mpa (28 days)</td>
</tr>
<tr>
<td><strong>Crushing strength</strong></td>
<td>0.19 Mpa (28 days)</td>
</tr>
<tr>
<td><strong>Wind erosion resistance</strong></td>
<td>15 m/s β=90° y β= 15°</td>
</tr>
<tr>
<td><strong>Toxic/Pathogenic</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Free crystalline silica asbestos</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Weighted sound absorption ratio</strong></td>
<td>αw=0.8 (H) Class C</td>
</tr>
<tr>
<td><strong>Acoustic absorption class</strong></td>
<td>αw=0.6 (H) Class B</td>
</tr>
<tr>
<td><strong>Adherence</strong></td>
<td>0.011 N/mm² failure</td>
</tr>
<tr>
<td><strong>Intended use category</strong></td>
<td>Z₁, Z₂</td>
</tr>
<tr>
<td><strong>Marketing</strong></td>
<td>25 kg sacks in 600 kg pallets</td>
</tr>
</tbody>
</table>
Steel structures are a construction system used worldwide. One of the main advantages is that they have great resistance per weight unit, which provides them with tremendous versatility and the possibility of creating complex yet light structures.

By contrast, one of the drawbacks of steel is its high thermal conductivity. Therefore, in the event of a fire, the progressive increase in temperature plus steel high heat transmission result in a reduction of the structure’s bearing capacity and mechanical resistance. The resistance and elastic limit are modified after 250 °C, and after approximately 500 °C the drop in resistance is significant enough so as not to support its design capacity.

To avoid this, mercortecresa® introduces Tecwool® F mortar, tested pursuant to standard UNE ENV 13381-4 to determine the mortar fire protection properties when applied to steel structural elements: beams, pillars or tension members. Tecwool® F has been designed and tested to cover a great variety of steel profiles characterised by their section factors. Likewise, it is tested for several design temperatures specified in the standard.
**Application**

**Tecwool® F** is spread with a pneumatic machine pursuant to the following technical specifications:

- The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

- The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

- It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

**Tecwool® F** can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

For further information, see application and general usage (pg. 48).

**Test**

**Standard:** UNE ENV 13381-4

**Laboratory:** APPLUS

**Test Nº:** 08/32302469

**Lab:** FIRES

**Test Nº:** FR-082-09

**Solution**

1. Steel Profile.
2. **Tecwool® F** (thickness according to the profile’s section factor and fire resistance time required).
Steelwork Protection

TECWOOL® F application on a metal structure is performed covering the entire surface of the profile that could be attacked by fire.

We define the profile section factor (profiled) or mass factor as: the relation between the section of the exposed external perimeter of the structural element itself per unit of length and its volumetric section per unit of length.

To simplify the calculation, the following expression is used:

\[
\text{Mass} = \frac{P}{A} \text{ (m}^{-1}\text{)}
\]

where:

- \(P\) = Profile’s protected straight section perimeter (m).
- \(A\) = Profile’s straight section area (m\(^2\)).

### MASS CALCULATION EXAMPLES FOR HEB - 180

**HEB – 180 profile measures**

\(h = 180 \text{ mm} / b = 180 \text{ mm} / t = 8.5 \text{ mm}\)

1. **4 sided “profiled” protection example** (See Fig. II)
   - Perimeter exposed to fire calculation:
     \[
P = 4b + 2h - 2t = 4 \times 180 + 2 \times 180 - 2 \times 8.5 = 1063 \text{ mm} = 1.063 \text{ m}
\]
   - Profile section:
     \[
A = 65.3 \text{ cm}^2 = 0.00653 \text{ m}^2
\]
   - Section factor:
     \[
\frac{1.063}{0.00653} = 162.8 \text{ (m}^{-1}\text{)}
\]

2. **2 sided “profiled” protection example** (See Fig. IV)
   - Perimeter exposed to fire calculation:
     \[
P = 2b + h - t = 2 \times 180 + 180 - 8.5 = 531.5 \text{ mm} = 0.5315 \text{ m}
\]
   - Profile section:
     \[
A = 65.3 \text{ cm}^2 = 0.00653 \text{ m}^2
\]
   - Section factor:
     \[
\frac{0.5315}{0.00653} = 81.4 \text{ (m}^{-1}\text{)}
\]

Once the profile’s form factor is known, we should look at the mortar thickness specification chart and find the TECWOOL® mortar to be applied for that thick mass so as to comply with the required fire resistance.
## MORTAR THICKNESS SPECIFICATION CHART ACCORDING TO THE REQUIRED FIRE RESISTANCE AND THE PROFILE’S SECTION FACTOR

The information in this chart appears in the characteristics report under file 08/32302469.

Valid chart for 500°C design temperature on steel pursuant to UNE ENV 13381-4

<table>
<thead>
<tr>
<th>Massivity (m²)</th>
<th>R 15 min</th>
<th>R 30 min</th>
<th>R 45 min</th>
<th>R 60 min</th>
<th>R 90 min</th>
<th>R 120 min</th>
<th>R 180 min</th>
<th>R 240 min</th>
<th>R 300 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>[15]</td>
<td>[15]</td>
<td>[15]</td>
<td>[15]</td>
<td>[17]</td>
<td>[23]</td>
<td>[35]</td>
<td>[47]</td>
<td>[59]</td>
</tr>
<tr>
<td>320</td>
<td>[15]</td>
<td>[15]</td>
<td>[18]</td>
<td>[22]</td>
<td>[29]</td>
<td>[37]</td>
<td>[52]</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>330</td>
<td>[15]</td>
<td>[15]</td>
<td>[18]</td>
<td>[22]</td>
<td>[29]</td>
<td>[37]</td>
<td>[52]</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>340</td>
<td>[15]</td>
<td>[15]</td>
<td>[18]</td>
<td>[22]</td>
<td>[30]</td>
<td>[37]</td>
<td>[52]</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
2 - Reinforced concrete protection.

Used in most of modern buildings, concrete is part of today’s landscape because of its multiple applications. However, concrete strength could be seriously impaired when exposed to fire, reducing its resistance when temperature exceeds 300 °C and losing it almost completely above 550 °C. In the case of reinforced concrete, framework resistance decreases after 250 °C, damaging the adherence between steel and concrete.

Mercortecresa® markets Tecwool® F mortar, tested pursuant to standard UNE ENV 13381-3, this test determines its capacity to provide protection against fire, to remain cohesive and fixed to concrete and to provide data on the temperature distribution in the entire protected concrete element when exposed to standard temperature/time curve.

The temperature information obtained in the tests performed is used to provide:
- The relation among concrete temperature, time and thickness of the fire protection material.
- Concrete equivalent thickness.

Light, normal or heavy concrete could be used, strength classes being 20/25 (LC/C/HC) to 50/60 (LC/C/HC). The member can contain steel reinforcing bars.
Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence. The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc. It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

For further information, see application and general usage (pg. 48).

**APPLICATION**

**TEST**

Standard: UNE ENV 13381-3
Laboratory: CIDEMCO
Test N°: 24033
Laboratory: FIRES
Test N°: FR-066-09

**SOLUTION**

Concrete.
1. Tecwool® F (thickness according to concrete thickness and fire resistance time required).
Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum setting of the cement.

For further information, see application and general usage (pg. 48).
FIRE PROTECTION THICKNESS CURVE ACCORDING TO CONCRETE THICKNESS
CRITICAL TEMPERATURE AT 500°C. SLABS

CONCRETE EQUIVALENT THICKNESS CURVE ACCORDING TO APPLIED
PROTECTION THICKNESS CRITICAL TEMPERATURE AT 300°C
Increasingly often we are seeing concrete pillars or beams being reinforced using carbon fibre. This lateral restriction of the concrete improves its strength by reducing cracking by compression and increasing ductility.

This type of reinforcement is typically used in refurbishment work where it is necessary to reinforce the existing structure due to change of use, adaptation to current standards or simply to repair it or make good original defects.

However, carbon fibre and the resins used in its application are extremely sensitive to temperature increases, which often make them unsuitable for performing the functions for which they were designed. Tecwool® F enables the carbon fibre to remain below 81.4 °C for two hours (for more information please contact our sales department).
The carbon fibre surface must be rough, with this being achieved by sprinkling silica sand onto the still tacky outer coating of resin. This prevents any problems regarding the bond between the mortar and the resin (please contact our sales department for more information).

The surface to be protected shall be totally free of dust, oil and/or grease, loose particles, traces of paint, etc. It is advisable to give the facing of the structure a light wash down using the water of the application hose itself in order to remove any remaining dirt. This shall also ensure that a thermal balance is reached between the mortar and the applied surface.

Tecwool® F can provide different finishes: rough, smooth, painted, etc. in accordance with the look required. For smooth finishes, once the application has been completed a roller must be lightly applied to the damp mortar until the desired finish is achieved. It is possible to apply elastic acrylic coatings to the mortar to prevent water vapour from penetrating the structure. The mortar must be totally dry (28 days) prior to application.

Following projection, the mortar must be lightly sprayed with water in order to ensure that the cement hardens in optimum conditions.

For more information, please refer to “Application and General Uses” (pg. 48).
We often find this type of solution both in new and refurbishment works as this kind of structure is really easy to assemble. It consists of a profiled metallic sheet that serves as the formwork base where a concrete slab is later added.

However, in the event of a fire, the simplicity of the solution itself entails the risk of the metallic sheet being directly exposed to fire, rendering the slab structure vulnerable. 

Mercortecresa® markets Tecwool® F, tested pursuant to standard UNE ENV 13381-5. With the temperature information obtained from the steel sheet through the concrete’s thickness and non-exposed surface, we calculate:

- The relation among steel temperature, time and thickness of the fire protection material.
- Concrete equivalent thickness, in relation to the thermal insulation criteria.
- Information on adherence capacity and exposure limit time.

For intermediate thickness values of the fire protection system, the time for regular temperature to increase up to 350ºC is obtained through linear interpolation.

Light, normal or heavy concrete could be used, strength classes being 20/25 (LC/C/HC) to 50/60 (LC/C/HC). The member can contain steel reinforcing bars.
Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence. The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc. It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

For further information, see application and general usage (pg. 48).

**APPLICATION**

**TEST**

**Standard:** UNE ENV 13381-5  
**Laboratory:** APPLUS  
**Test N°:** 10/100324-148

**SOLUTION**

1. Concrete forging.  
2. Profiled steel sheet.  
3. **Tecwool® F** (thickness according to concrete thickness and fire resistance time required).
In refurbishment building work, we usually find non-conventional slab structures. In this case, we have a slab structure consisting of a 50 mm thick concrete compression layer under which a hollow ceramic board supported by 140 x 140 mm wooden section beams is placed.

The test was performed pursuant to UNE EN 1365-2. Thermocouples were placed on the compression layer and throughout wooden beams, with the purpose of extrapolating the results to other more favourable configurations, provided that they remain within the limitations of the abovementioned standard.

For further information, Annex E to DB SI describes a calculation method to determine wooden structural elements’ resistance to the action represented by the standard time/temperature curve. Fire resistance is mainly determined by beam sizes, fire exposure and the loads supported by them.
Due to wood particular characteristics, Tecwool® F application in this solution differs from other analysed faces. Wood hygroscopicity makes it absorb or release water from the surrounding environment. To avoid adherence problems from wood shrinking, its surface is covered with a wire mesh fastened with clamps or the like after applying Tecwool® F mortar. The mesh acts as reinforcement between the product and the face, providing extra flexibility and adherence to the support structure, regardless of its expansion. The application on the ceramic block is similar to that on concrete slabs and walls. It is important to verify that there are no holes in slab structure to avoid material waste and to provide the spread with a uniform and homogeneous finishing. For further information, see application and general usage (pg. 48).
Most of new constructions are crossed by several installations such as: cables, pipelines, conduits, ventilation shafts, etc. These installations alter the subdivisions of the splitting elements, allowing fire and smoke to pass through different fire areas.

Both the Technical Building Code and the Safety Regulations against Fire in Industrial Facilities offer several solutions to prevent smoke and fire propagation throughout the installations.

Tecwool® F mortar, the solution offered by mercortecresa®, consists in providing elements with a resistance equal to or above the resistance of crossed elements. That is, the mortar directly applied to the sheet provides the solution with the integrity and insulation established by the standard, ensuring full sealing lengthways.

In the specific case of this solution, a 0.6 mm plated duct was exposed to external fire, the classification obtained being EI-120.
Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

For further information, see application and general usage (pg. 48).
6.2 VERTICAL GALVANIZED DUCT PROTECTION. EI-120

VERTICAL GALVANIZED DUCT PROTECTION. EI-120

Tecwool® F

Ventilation is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum setting of the cement.

For further information, see application and general usage (pg. 48).

**APPLICATION**

**SOLUTION**

**TEST**

Standard: UNE EN 1366-1
Laboratory: AFITI-LICOF
Test Nº: 1101T07

1. 0.6 mm thick metal plated vertical duct.
2. **Tecwool** F (55 mm thick).
3. Boards **Tecbor** B 40.
4. Metal angle 30x30x3 mm.
5. Concrete Slab

**TECWOOL® F**

Galvanized duct protection
1. Section changes.

2. Dislevelment.


5. Vertical anchor and horizontal coupling.

* For building details on connection, please contact to our sales department.
Safety Regulations against Fire in Industrial Facilities indicate that, when a dividing wall or a splitting construction element in fire prone areas connects into the roof, the resistance of the latter will be at least equal to half of that established for the construction element in a 1-metre firebreak.

The firebreak could be:
- Roof built-in as long as the firebreak presence is justified after non-resistant roof parts collapse.
- Fixed to the roof structure when it has the same fire stability as the firebreak resistance required.
- Made of a 1-metre wide barrier underneath the roof fixed to the diving wall, providing the fire resistance required. In no case should the barrier be installed at a distance greater than 40 cm from the roof lower part.

Mercortecresa® has designed and conducted this solution pursuant to the following European Standard (Document/Protocol): “Fire Resistance Test of dividing wall/roof firebreak,” the classification obtained being EI-60 y EI-120.
Firstly a bracket is constructed using 48x36x0.5 mm wall support sections and 46x36x0.6 mm mountings as shown in the illustration. The sections are joined using 4.2x27 mm metal-metal screws. The brackets are located every 600 mm and attached to the supporting structure using 10x100 mm metal frame anchors. The metal-ribbed mesh is then screwed onto the brackets using 4.2x27 mm sheet metal screws. 47 mm of Tecwool® F is now projected onto the metal-ribbed mesh.

The upper part of the metal-ribbed mesh is coated with a 0.03 mm film to facilitate the mortar application process.

The dimensions of the fire break test are 1.05x5 m, and this may be extended lengthways if and when the anchor elements and fixed edging seal are maintained along the entire length thereof.

Likewise, the width of the fire breaks incorporated into the roof or supported thereby may be increased by 20% if and when enough additional anchor points are fitted in order to ensure that the weight supported by each anchor point is not exceeded.

 Tilting the structure by up to 25º with respect to the configuration tested is accepted.

For more information, please refer to “Application and General Uses” (pg. 48).

---

**APPLICATION**

1. 10x100 mm metal frame anchor.
2. 46x36x0.6 mm mounting.
3. 48x36x0.5 mm wall support section.
4. 4.2x27 mm sheet metal screw.
5. Metal-ribbed mesh
6. Tecwool® F (thickness of 47 mm)
7. Partition wall

**TEST**

Standard: Fire belt barrier system EI-60
Laboratory: AIDICO.
Test Nº: IE 100300.

**SOLUTION**

**Dividing wall/roof firebreak**
**APPLICATION**

The 45x15x0.5 mm omega profiles are attached to the IPE 160 steel profile using 19 mm nails for steel. The distance between omegas is 600 mm.

Next, the metal-ribbed mesh is attached to the omegas using 4.2x27 mm screws and then 48 mm of Tecwool® F is projected onto it.

The upper part of the metal-ribbed mesh is coated with a 0.03 mm film to facilitate the mortar projection process.

The dimensions of the fire break test are 1,05x5 m, and this may be extended lengthways if and when the anchor elements and fixed edging seal are maintained along the entire length thereof.

Likewise, the width of the fire belts incorporated into the roof or supported thereby may be increased by 20% if and when enough additional anchor points are fitted in order to ensure that the weight supported by each anchor point is not exceeded.

Tilting the structure between 20º and 50º with respect to the configuration tested is accepted.

For more information, please refer to “Application and General Uses“ (pg. 48).

**TEST**

**Standard:** Fire belt barrier system EI-60.
**Laboratory:** AIDICO.
**Test Nº:** IE 100300.

**SOLUTION**

1. IPE 160 metal girder.
2. 4.2x27 mm sheet metal screw.
3. Metal-ribbed mesh.
4. 19-mm rivet for steel.
5. 45x15x0.5 mm Omega support strut.
6. Tecwool® F (thickness of 48 mm).
7. Partition wall
**APPLICATION**

The 40x40x1 1 m long support struts are attached to the partition wall using 10x100 mm anchor elements, with the distance between struts being 950 mm. The next elements to be fitted are the 150 mm long TC 60/27 type hangers, which are screwed on using MM 4.2x13 mm screws and consist of a clevis, 6-mm threaded rod and a Sinar-type staple attached to the strut. Next, the 0.6 mm thick laminated metal sheeting is installed and 37 mm of Tecwool® F mortar is applied to it. The dimensions of the fire break test may be extended lengthways if and when the anchor elements and fixed edging seal are maintained along the entire length thereof.

Likewise, the width of the fire breaks incorporated into the roof or supported thereby may be increased by 20% if and when enough additional anchor points are fitted in order to ensure that the weight supported by each anchor point is not exceeded. Tilting the structure by up to 25° with respect to the configuration tested is accepted.

For more information, please refer to “Application and General Uses” (pg. 48).

**TEST**

**Standard:** Party wall/roof fire break fire resistance test protocol.

**Laboratory:** CIDEMCO.

**Test N°:** 21083.

**SOLUTION**

1. 40x40x1 support struts of one metre in length.
2. 0.6 mm thick metal sheeting.
3. Tecwool® F (thickness of 37 mm).
4. Partition wall.

---

**Diagram**

- **1:** 40x40x1 support struts
- **2:** 0.6 mm thick metal sheeting
- **3:** Tecwool® F (thickness of 37 mm)
- **4:** Partition wall
8 - Tunnel Protection

In case of a fire in a tunnel, material and human damages can only be avoided if the tunnel is adequately protected against fire.

In the last 10 years, several fires in tunnels have occurred worldwide. One of the conclusions is that we cannot simulate fires in tunnels with the same criteria applied to other constructions.

In this case, fires are destructive and reach high temperatures very rapidly. Besides, they can maintain these conditions during long periods of time. In other words, the standard time/temperature curve included in standard UNE EN 1363, representing the pattern of a fire occurring in a certain fire section, is not suitable for evaluating fires in tunnels.

Consequently, we shall study the effects on materials through fire simulations produced by the combustion of hydrocarbons.

Other effect observed in fires developed in tunnels is referred to as “spalling” or concrete spalling process. As temperature rises, water in the concrete evaporates. However, steam does not run off properly causing the internal pressure to increase and the layers closer to the fire to spall off.

Mercorteca has tested Tecwool® F mortar in a real scale tunnel exposed to a gasoil-caused fire. A 40 mm mortar application was enough to surpass the test performed in San Pedro de Anes by Tunnel Safety Testing S.A.
Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence. The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

For further information, see application and general usage (pg. 48).
Tecwool® 825 is a mortar made of rock wool, cement and small amounts of heat-resistant material manufactured by mercortecresa® and specifically designed for protection against fire in industrial facilities. Its cement content makes it highly robust. Once spread, it looks like a monolithic block highly resistant to erosion and semi-exposed or partially covered areas.

Tested under hydrocarbons curve, RWS curve and American UL standards, Tecwool® 825 has been subjected to simulations to evaluate fires at high temperatures during a long period of time.

Tecwool® 825 adapts to a wide variety of supports, even when exposed to settlement vibrations or movements. No cracking or crazing as a result of its perfect adherence and flexibility.

Due to its alkalinity, the product resists fungi, does not corrode steel or release toxic or flammable vapour.
## TECHNICAL CHARACTERISTICS AND SPECIFICATIONS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Composition</strong></td>
<td>Cement, rock wool and additives</td>
</tr>
<tr>
<td><strong>Fire reaction</strong></td>
<td>A1</td>
</tr>
<tr>
<td><strong>Bulk mortar density</strong></td>
<td>385 Kg/m³ ± 10%</td>
</tr>
<tr>
<td><strong>Densidad aparente del mortero endurecido</strong></td>
<td>843 Kg/m³ ± 10%</td>
</tr>
<tr>
<td><strong>Densidad aparente del mortero fresco</strong></td>
<td>1070 Kg/m³ ± 10%</td>
</tr>
<tr>
<td><strong>Alkalinity (pH value)</strong></td>
<td>12.5</td>
</tr>
<tr>
<td><strong>Resistance to fungi</strong></td>
<td>Immune</td>
</tr>
<tr>
<td><strong>Marketing</strong></td>
<td>30 kg sacks in 720 Kg pallets</td>
</tr>
</tbody>
</table>
1 - Steelwork protection

Fire resistance of structural members

Metallic structures in chemical, petrochemical and power generating plants, among others, are likely to suffer fires generally caused by hydrocarbons.

Tecwool® 825 has been tested pursuant to standard UNE ENV 13381-4, and subjected to UL 1709 temperature curve, to determine its contribution to fire protection when applied to steel structural elements: beams, pillars or tension members.

Tecwool® 825 has been designed and tested to cover a great variety of steel profiles characterised by their section factor. Likewise, it is tested for several design temperatures specified in the standard.
Tecwool® 825 is spread with a pneumatic machine pursuant to the following technical specifications:

A wire mesh should be fastened to the support with electro-welded nails or the like, before applying mortar. The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc. It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface. For further information, see application and general usage (pg. 49).

**APPLICATION**

**TEST**

| Standard: UNE ENV 13381-4 |
| Laboratory: Laboratorium Voor Aawending Der Brandstoffen. En Warmteoverdracht |
| Test N°: 10996A UL CURVE |
| Laboratory: FIRES |
| Test N°: FR-057-09 |

**SOLUTION**

1. Steel profile.
2. Wire mesh.
3. Tecwool® 825 (thickness according to the profile’s section factor and fire resistance time required).
2 - Tunnel protection

We have previously emphasized the importance to protect tunnels. For this purpose, Tecwool® 825 has been tested in accordance to RWS Protocol/ Efectis “Fire resistance of coatings to protect concrete” and subject to the RWS and HCM fire curves, adapting to the more common normative requirements worldwide. During the 3 hours of testing, temperature on the concrete surface never exceeded 201 °, well below the maximums established in the protocol: 380 ° on the surface and 250 ° in the steel reinforcements, resulting a Tecwool® 825 superb insulation performance.

Tecwool® 825 has also showed a great adhesion capacity to concrete and steel, a monolithic finish and, due to its content of mineral wool, avoids the appearance of cracks over the time.
**TEST**

**Standard:** Protocolo RWS / Efectis
Fire testing procedure for concrete tunnel.
**Laboratory:** Efectis Netherland.
**Test Nº:** 2010-Efectis-R0531.

**APPLICATION**

**Tecwool® 825** is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

For further information, see application and general usage (pg. 49).

**SOLUTION**

1. Concrete walls or slabs.
2. **Tecwool® 825** (thickness is depending on the fire resistance required and construction characteristics).
A wire mesh should be fastened to the support with electro-welded nails or the like, before applying mortar.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces.

In structures prone to bumps, a wooden mortar formwork could be installed. During the spreading, mortar is pressed with a roller in order to render Tecwool® 825 highly robust.

The spreading process is carried out with an appropriate machine, which pushes the Tecwool® 825 dry mortar through the hose all the way to the nozzle, where it is mixed with plenty of water to be applied later on. The spreading machine provides a flow between 3.2 and 18 kg/min. Mortar is applied with a spreading gun perpendicular to the support at a distance between 50 and 150 cm.

Tecwool® 825 cannot be applied above 40°C or below 2°C. It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® 825 can provide different finishes: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

In general, all contraindications regarding cement apply to Tecwool® 825. Application of this product on non-ferrous metals is prohibited.
Sealings

Sealing Systems

Tests

MercoTecresa® constantly evolves and adapts to the changes in standards, developing new tests in off international entities, pursuant to UNE EN, BS, UL, etc.

Our dedication to the comprehensive development of the Tecsel® sealing systems has led us to perform customer-specific

Traceability

The sealing systems undergo an internal quality control that provides guaranteed knowledge of the history, location and path of our batches.

Quality

All Tecsel® products are subject to rigorous controls to ensure they possess the precise specific

Our end goal is for our customers to be fully satisfied with the quality of our products.

Specialisation

Our aim is that each individual and concrete case that we come across in our daily work has a specific

Application

We seek to provide the greatest ease and speed in our assemblies, making our solutions the most competitive on the market.

Technical Assistance

The technicians working in our sales department offer personalised customer care and advice, both in terms of building solutions and regulations.

International Development

Both directly and through the Mercor® Group, companies MercorTecresa® sells its products all over the world, aiming to become a benchmark company in the passive fi
Services crossings are risky volatile points since fire can spread very quickly through them. In most modern buildings, the installations are considerably more complex and, as a result, must be taken into account when designing the fire compartmentalisation.

The risk of propagation in the event of a fire must be reduced by using Sealing Systems for penetrations, at the points in which the services pass through different fire compartments.

Most building codes indicate that the level of fire propagation elements must be reinforced at the points in which installations such as cables, pipes, conduits, ventilations shafts, etc. pass through these elements. In order to do this, a certified sealing solution must be used that, in event of fire, seals off the intersection and guarantees that this point is at least as fire resistant as the crossed element.
1 - Tecbor® Joint paste ready to use

Tecbor® Joint paste ready to use is an ablative coating containing an aqueous dispersion of blinding polymers that produce an endothermic reaction in event of fire spread or fire and smoke.

Tecbor® Joint paste ready to use is most commonly used for to protect cables trays in order to ensure that electricity is maintained during a fire, form secure joints in ductwork formation.
### TECHNICAL CHARACTERISTICS AND SPECIFICATIONS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH-value</td>
<td>Approx. 8.</td>
</tr>
<tr>
<td>Colour</td>
<td>Greyish-white.</td>
</tr>
<tr>
<td>Odour</td>
<td>Faint.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Light paste.</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Non-flammable.</td>
</tr>
<tr>
<td>Solids</td>
<td>66% - 76%.</td>
</tr>
<tr>
<td>Density</td>
<td>1.55 ± 0.07 g/cm³.</td>
</tr>
<tr>
<td>Diluent</td>
<td>Add the quantity of water required to obtain the desired viscosity. Dilute at around 5%.</td>
</tr>
<tr>
<td>Productivity</td>
<td>Approx. 2.05 kg/m² for a 1 mm dry layer.</td>
</tr>
<tr>
<td>Drying time</td>
<td>Between 24 and 72 hours, depending on temperature, humidity and the thickness of the layer applied. Full cure is achieved a week after being applied.</td>
</tr>
<tr>
<td>Hazard type</td>
<td>No recognised hazards according to EU regulations.</td>
</tr>
<tr>
<td>Toxicity</td>
<td>The combustion vapours are toxicologically inoffensive, according to DIN 4102 - A2, 08.09.1986, of RWTH Aachen, issued by Elektrophysik Aachen GmbH, 11.12.1997</td>
</tr>
<tr>
<td>Storage</td>
<td>Recommended storage temperature 5°C - 30°C</td>
</tr>
</tbody>
</table>
The combination of 145 kg/m² rock wool with Techor\textsuperscript{®} Joint paste ready to use, creates a comprehensive sealing system for all types of installations.

It is especially useful for protecting metallic trays through which cables are run and that are located on both decking and walls, as well as on rigid and flexible supports.

Ducts that are not properly sealed off become genuine chimneys in the event of a fire. In addition to the possibility of vertical propagation, the ducts must also be horizontally sealed in order to prevent them from transferring the fire compartments on the same floor. Techor\textsuperscript{®} Joint paste ready to use is the perfect solution for preventing the propagation of a fire through the service shafts.

<table>
<thead>
<tr>
<th>TEST POSITION</th>
<th>THICKNESS</th>
<th>EI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>50 mm</td>
<td>120</td>
</tr>
<tr>
<td>Horizontal</td>
<td>60 mm</td>
<td>180</td>
</tr>
<tr>
<td>Vertical</td>
<td>40 + 40 mm</td>
<td>240</td>
</tr>
<tr>
<td>Vertical</td>
<td>50 mm</td>
<td>120</td>
</tr>
</tbody>
</table>
APPLICATION AND USE

Tecbor® Joint Paste ready to use is a pre-mixed coating.

Before application, it is advisable to stir the paste. Add the quantity of water required to obtain the desired viscosity.

Before application, check that the surfaces are clean and free from any oil or dust.

Apply with airless spray gun. For smaller holes, a trowel or brush may be used.

Once applied, the product can withstand temperatures ranging from -40°C to +80°C with no chemical degradation, decolouration or reduced eff

It is not susceptible to humidity and can therefore be used outside. If there is too much humidity when creating the seal, it is advisable to apply the paste in various layers, thereby facilitating the drying process.

Contact our sales department for more information.

Application procedure:

1. Services crossings cables trays that cross over various fi
2. Measure the gap to be covered and cut the wool to size. Take special care to cover even the smallest cracks that appear on the cables and the supporting structure.
3. Apply the Tecbor® Joint paste ready to use over both sides of the wool on cables, apply least 200 mm on each side. The paste will be at least 1.1 mm thick when dry.

TESTS

Standard: UNE EN 1366-3
Lab: CIDEMCO TECNALIA and APPLUS
Test No: 13742 and 07/32301097 M1.
Provided the electrical system must remain fully operational during a fire protection. In public buildings and high-rise buildings, it is critical that the basic systems remain operative in order to carry out a proper evacuation.

The application of Tecbor® Joint paste ready to use ensures a continuous power supply in event of fire. Since the cables to be repaired or changed can be re-protected by applying a new coat of paste.
APPLICATION AND USE

Tecbor® Joint Paste ready to use is a pre-mixed coating.

Before application, it is advisable to stir the paste. Add the quantity of water required to obtain the desired viscosity.

Before application, check that the surfaces are clean and free from any oil or dust.

Apply with airless spray gun. For smaller holes, a trowel or brush may be used.

Once applied, the product can withstand temperatures ranging from -40°C to +80°C with no chemical degradation, decolouration or reduced effi.

It is not susceptible to humidity and can therefore be used outdoors. If there is too much humidity when creating the seal, it is advisable to apply the paste in various layers, thereby facilitating the drying process.

Tecbor® Joint paste ready to use can be applied directly to trays and cables.

A 3.6 mm layer of Tecbor® Joint paste ready to use over the trays and cables ensures that electricity is continuously supplied for 2 hours. For other fire requirements, please contact our sales department.

TESTS

Standard: UNE EN 1363-1 + UL 1709
Lab: CIDEMCO TECNALIA.
Test N°: 24602 and 25417.

APPLICATION AND USE

Tecbor® Joint paste ready to use has also been tested to prevent the vertical propagation of fl in a conductor or cable.

Application procedures as described below 1.9 mm layer must be applied.

Contact our sales department for more information.
Tecsel® Intumescent mastic are intumescent sealants that are specially designed for joints in building construction and door frames, as well as small gaps in fire-resistant materials. When exposed to fire, Tecsel® Intumescent mastic expands, preventing the spread of gases and limiting the increase of temperature through the various compartments of the building. Fire resistance achieved depends on the size of the joint and the characteristics of the gaps to seal.

Tecsel® Intumescent mastic is very easy to apply. Once dry, it forms a strong adherence to the most commonly used building materials. These elastic properties prevent the mastic from transferring any stress to the edges of the joint.
APPLICATION AND USE

Before application, make sure that the surface to be treated is clean and dry.

The mastic is applied manually, by using an injection gun.

Applying an additional substrate of filling the joint helps to make sure the correct depth is achieved.

To create an even finish of edges of the joint with adhesive tape or similar and gently smooth over the surface with a slightly wet trowel.

It is important to check that all cracks have been filled in properly and the adhesion level between the substrate and the mastic.

Tecsel® Intumescent mastic for internal use can be painted is adequate whereas paint cannot be applied to the mastic for external use.

For more information, please contact our technical department.

PERFORMANCE

Productivity is calculated using the following formula:

\[ L = \frac{300}{A \times P} \]

Where:

\( L \) = Length achieved per cartridge in metres.
\( W \) = Width of the joint in mm.
\( D \) = Depth of the joint in mm.

SOLUTIONS

<table>
<thead>
<tr>
<th>TECSEL® INTUMESCENT MASTIC EXTERNAL</th>
<th>NEUTRAL CURING SILICONE. MAXIMUM WIDTH 30 MM EXTERNAL USE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical surface</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TECSEL® INTUMESCENT MASTIC INTERNAL</th>
<th>ACRYLIC RESIN. MAXIMUM WIDTH 30 MM INTERNAL USE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical surface</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TESTS

**Standard:** UNE EN 1366-4,
**Lab:** CIDEMCO TECNALIA.
**Test N**: 26445-4, 26445-5.
Tecsel® self-levelling silicone is a fi
sealant based on neutral curing and self-levelling
silicone rubber. It is designed to be applied to
expansion joints on horizontal surfaces that are
intended to bear substantial movement.
It is an ideal solution for sealing off openings in
slabs, facades and curtain walls.
APPLICATION AND USE

100 kg rock wool must be used as a base. The rock wool prevents stresses from being transmitted to the sealant and allows for an even depth of silicone to be achieved.

In light of the texture of this silicone, it is only applicable to horizontal joints, which in turn must be on horizontal surfaces.

The surfaces onto which it is applied must be dry and free from dust, oils, dirt, loose particles, etc.

It is important to check that all cracks have been filled in properly and the adhesion level between the substrate and the mastic.

*Tecsel® self-levelling silicone* cannot be painted or varnished.

The following formula is used as a rough guide for performance calculation:

\[ L = \frac{1000}{A \times P} \]

Where:

- \( L \) = Length of the joint achieved per litre in metres.
- \( W \) = Width of the joint in mm.
- \( D \) = Depth of the joint in mm.

TECHNICAL CHARACTERISTICS AND SPECIFICATIONS

Uncured *Tecsel® Self-levelling silicone* (4 weeks at 23°C and 55% RH)

<table>
<thead>
<tr>
<th></th>
<th>Appearance</th>
<th></th>
<th>Shore A Hardness (DIN 53505)</th>
<th></th>
<th>Elastic recovery (NF P85506)</th>
<th>Elastic modulus 100% (DIN 53504)</th>
<th></th>
<th>Tensile strenght (DIN 53504)</th>
<th>Ultimate Elongation (DIN 53504)</th>
<th>Movement of the joint in service</th>
<th>Resistance to temperature in service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Creamy, homogeneous and self-levelling paste.</td>
<td></td>
<td>14</td>
<td></td>
<td>90 %</td>
<td>0,20 MPa.</td>
<td></td>
<td>0,60 MPa.</td>
<td>700 %</td>
<td>25 %</td>
<td>+50 to + 150 °C</td>
</tr>
<tr>
<td>Skin formation (BS 5889 AP.A)</td>
<td>90 minutes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curing rate at 23°C and 55% RH</td>
<td>1 mm/day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of volume (DIN 52451)</td>
<td>5 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application temperature</td>
<td>+5 to + 50 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TECSEL® SELF-LEVELLING SILICONE

<table>
<thead>
<tr>
<th>Horizontal surface</th>
<th>Width x Depth (mm)</th>
<th>Fill</th>
<th>Classfi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15 x 10</td>
<td>LR (100 Kg)</td>
<td>El 240</td>
</tr>
<tr>
<td></td>
<td>30 x 20</td>
<td>LR (100 Kg)</td>
<td>El 240</td>
</tr>
<tr>
<td></td>
<td>50 x 30</td>
<td>LR (100 Kg)</td>
<td>El 240</td>
</tr>
</tbody>
</table>

TESTS

Standard: PROTOCOL / UNE EN 1363-1
Lab: CIDEMCO TECNALIA.
Test Nº: 28751
Tecsel® Foam is a self-expanding, single-component polyurethane highly fire-resistant. Tecsel® Foam are intumescent sealants that are specially designed for joints in building construction and door frames, as well as small gaps in fire-resistant material.

When exposed to fire, Tecsel® Foam expands, preventing the spread of gases and limiting the increase of temperature through the various compartments of the building.

Fire resistance achieved depends on the size of the joint and the characteristics of the gaps to seal.
TECSEL® FOAM
SELF-EXPANDING SINGLE-COMPONENT POLYURETHANE
MAXIMUM WIDTH 30 MM.

<table>
<thead>
<tr>
<th>Vertical surface</th>
<th>Width</th>
<th>Depth</th>
<th>Fill</th>
<th>Classifi</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>190</td>
<td>--</td>
<td>EI 120</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>190</td>
<td>--</td>
<td>EI 180</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>190</td>
<td>--</td>
<td>EI 120</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>70</td>
<td>LR</td>
<td>EI 120</td>
<td>d</td>
<td></td>
</tr>
</tbody>
</table>

TEST

**Standard:** UNE EN 1366-4

**Lab:** CIDEMCO TECNALIA.

**Test N°:** 26445-6

APPLICATION AND USE

**Tecsel® Foam** has an excellent adherence to the majority of commonly used building materials. Do not use on PP and PE.

Before application, make sure that the substrate is clean. If the surface requires cleaning, only non-organic solvents can be used. It is advisable to dampen the supporting structure before application as this improves adherence and drying.

Before application, place the adaptor in the valve and shake the aerosol for 20 seconds. Hold the container upside down and apply.

**Tecsel® Foam** can be applied to joints, gaps and opening on:
- Window and door frames.
- Cable, trays and duct penetrations.
- Joints between ceilings and walls.
- Filling between building elements.
- Thermal insulation in cavity walls.

The application temperature is between 5°C and 35°C.

Excess of product can be removed mechanically.

TECHNICAL CHARACTERISTICS AND SPECIFICATIONS

<table>
<thead>
<tr>
<th>Base</th>
<th>Polyurethane.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No longer sticky after*</td>
<td>8 min.</td>
</tr>
<tr>
<td>Drying time*</td>
<td>20-25 min.</td>
</tr>
<tr>
<td>Hardening time*</td>
<td>2 horas.</td>
</tr>
<tr>
<td>Performance</td>
<td>1000 ml given 35-40 l of foam.</td>
</tr>
<tr>
<td>Cellular structure</td>
<td>Delicate, with 70% to 80% of its structure made up of cells closed.</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40°C to +90°C (hardened).</td>
</tr>
</tbody>
</table>

* The above data was taken at 20°C and 65% R.H.
Tecsel® Flexible Sealant is a combination of mineral fillers and protective plastic coating.

This product is especially designed for expansion joints. Thanks to its versatility and large range of sizes, it is extremely easy to install.

When exposed to fire, Tecsel® Flexible Sealant expands, thereby preventing temperatures from rising and limiting the propagation of gases between the different fire rated elements.
**APPLICATION AND USE**

*Tecsel® Flexible sealant* is extremely quick and easy to install. Simply place the strip on the joint that you wish to protect.

The sealant adapts to the joints and can compress down by up to 50%, thereby ensuring that the movements of the joint over its useful life do not affect the stability of the sealant.

The strips are covered by a plastic coating, forming a partial barrier against environmental conditions.

**TECHNICAL CHARACTERISTICS AND SPECIFICATIONS**

*Tecsel® Flexible sealant* must be stored in a cool, dry place.

<table>
<thead>
<tr>
<th>UNITS - WIDTH - THICKNESS - LENGTH</th>
<th>JOINT LENGTH (mm.)</th>
<th>DISTANCE BETWEEN STRIPS</th>
<th>CLASSIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 30 x 15 x 1000 mm.</td>
<td>15</td>
<td>50 mm.</td>
<td>EI 180</td>
</tr>
<tr>
<td>2 x 40 x 20 x 1000 mm.</td>
<td>25</td>
<td>50 mm.</td>
<td>PH EI 180 - PV EI120</td>
</tr>
<tr>
<td>2 x 85 x 40 x 1000 mm.</td>
<td>50</td>
<td>50 mm.</td>
<td>PH EI 180 - PV EI120</td>
</tr>
<tr>
<td>2 x 120 x 50 x 1000 mm.</td>
<td>70</td>
<td>50 mm.</td>
<td>EI 180</td>
</tr>
</tbody>
</table>

**TEST**

Standard: EN 1366-4  
Lab: CHILTERN.  
Test No: IF11069
Most ceilings, which need to be fire resistance, will usually have some kind of lighting system. In addition, more fire sockets or electrical boxes are equipped with comprehensive fire protection. Mercortecresa offers the following products:

- Tecsel® Lighting cover
- Tecsel® Socket cover

Both solutions are a combination of graphite and mineral wool which swells when exposed to fire, sealing any gap and preventing the spread of fire and flames to the adjacent fire-risk areas.

Clean and light solutions extremely easy to install.
SEALING SYSTEMS

Tecsel® Lighting Cover

APPLICATION AND USE

TECSEL® LIGHTING COVER

The protective covers are installed without any kind of additional anchorage.

They are adaptable to any situation thanks to their broad versatility and can be installed from both below and above the ceiling.

A certain level of ventilation is allowed to prevent the overheating on the appliances. Passing of cables through Tecsel® Lighting Cover has been satisfactorily tested.

Please ask for further information about each type of installation.

TECSEL® SOCKET COVER

FORMAT DIMENSIONS

<table>
<thead>
<tr>
<th>FORMAT</th>
<th>DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>152 x 130 x 40 mm</td>
</tr>
<tr>
<td>Large</td>
<td>200 x 130 x 40 mm</td>
</tr>
</tbody>
</table>

* Please ask for other measurements.

TEST

Standard: BS 476 Part 23
Lab: BRE
Test No: FG8962/208217

APPLYING AND USE

TECSEL® SOCKET COVER

Tecsel® Socket Covers come in a range of standard sizes and are perfectly adaptable to the boxes with no need for fittings or adhesives.

Please ask for further information about each type of installation.
A common problem with fire arises when we require the free circulation of air alongside an effective fire protection system.

*Tecsel® Grilles* are palusol sheets wrapped in PVC. Palusol is made from sodium silicate, a small amount of organic material and reinforced with fibreglass. Both faces have an epoxy resin layer that protects the intermediate layer from ambient conditions (water, steam and CO₂).

When exposed to temperatures above 100°C, *Tecsel® Grille* expands and forms a layer of foam consisting of fire resistant pores, acting as a thermal insulator, preventing the transfer of heat, fire and smoke.

When unexposed to fire, the grille allows for the ventilation systems to fully and freely circulate the fire.
TECSSEL® GRILLES. For ventilation systems

<table>
<thead>
<tr>
<th>Vertical surface</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (mm)*</td>
<td></td>
</tr>
<tr>
<td>250 x 250 x 40</td>
<td>E 120</td>
</tr>
<tr>
<td>250 x 250 x 50</td>
<td>E 120</td>
</tr>
<tr>
<td>250 x 250 x 60</td>
<td>E 120</td>
</tr>
<tr>
<td>400 x 400 x 60</td>
<td>E 120</td>
</tr>
<tr>
<td>400 x 400 x 50</td>
<td>E 120</td>
</tr>
<tr>
<td>400 x 400 x 40</td>
<td>E 120</td>
</tr>
<tr>
<td>600 x 600 x 60</td>
<td>E 120</td>
</tr>
<tr>
<td>600 x 600 x 40</td>
<td>E 120</td>
</tr>
<tr>
<td>600 x 600 x 60 + alu</td>
<td>E 120</td>
</tr>
<tr>
<td>400 x 200 x 40 x 4 rejillas</td>
<td>E 120</td>
</tr>
<tr>
<td>300 x 300 x 50 (doble)</td>
<td>EI 180</td>
</tr>
</tbody>
</table>

* Other sizes available on request.

TECSSEL® GRILLES

APPLICATION AND USE

TECSSEL® Grilles are mechanically attached to the supporting constructive element with the appropriate screws, plugs or fittings (these must have at least the same level of fire resistance as the structure onto which they are fixed).

If there are any gaps between the grille and the supporting element, these should be filled with TECSSEL® Intumescent mastic.

For a greater ventilation arcage than the grille size, TECSSEL® Grilles can be installed on the following structures: walls, doors, fl partitions, cable trays.

TESTS

Standard: UNE EN 1363-1, UNE 1366-3.
Lab: CIDEMCO TECNALIA
Test N°: 23548 and 17219-1
Tecsel® Pillows are made from intumescent graphite combined with silicates, they are packaged in polyethylene bags covered by mineral fibre fabric.

Tecsel® Pillows are a very versatile solution for sealing up irregular gaps in cable trays or for closing up holes in walls and floors.

The key difference between Tecsel® Pillows and other sealing solutions is that they are extremely quick and easy to install. Their maintenance is also very straightforward as they can simply be removed and replaced in a clean and convenient manner.
**APPLICATION AND USE**

*Tecsel® Pillows*, are positioned manually to fill any gaps by placing the longest dimensions in parallel to the crossing services.

Check all gaps are filled and the pillows are sufficiently pressed into position. In addition, the filling should be evenly distributed throughout the entire pillow.

**Tecsel® Pillows** are especially useful for uneven installations subjected to frequent modifications. If the pillows are not exposed to fire, they can be limitlessly reused.

**DIMENSIONS**

<table>
<thead>
<tr>
<th>DIMENSIONS*</th>
<th>CLASSIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 x 100 x 35 mm</td>
<td>EI 240</td>
</tr>
<tr>
<td>300 x 150 x 35 mm</td>
<td>EI 240</td>
</tr>
<tr>
<td>300 x 200 x 35 mm</td>
<td>EI 240</td>
</tr>
</tbody>
</table>

*Existen otros tamaños disponibles por pedido.

**TESTS**

*Standard:* UNE EN1366-3  
*Lab:* CIDEMCO TECNALIA.  
*Test N°:* 13742
Mercortecresa® offers a range of solutions that prevent the spread of fire, gases and smoke through plastic pipes located in walls, partitions or slabs; providing integrity and insulation.

In event of fire at around 105°C, at this point the intumescent sealant begins to expand, by sealing the pipe penetration.

**TESTS**

Tecsel® Solutions for plastic pipes have been tested according to the European standard UNE EN 1366-3 and the British standard BS 476 part 20.
1 - Tecsel® Multicollars

EI 120 - EI 180 - EI 240

Tecsel® Multicollars are made from a continuous band of punched stainless steel with an intumescent strip placed inside the frame. This band fits perfectly to any tube as it allows the Multicollar to be adjusted to the exact measurements.

Tecsel® Multicollars have an expansion capacity of up to 11 times their original thickness, creating a microporous layer that prevents the transfer of flames, smoke or hot gases.

There is no adhesive between the metal band and the intumescent strip, thereby it prevents any possible stress when attaching the Tecsel® Multicollar to the pipe.
APPLICATION AND USE

1. Lay out the Tecsel® Multicollar and measure the length of the graphite strip and no. of sections required, depending on the diameter of the pipe (see table of diameters).

2. Cut up the graphite to the required size.

3. Fold and then cut the punched band at the point where the graphite has been cut.

4. Position the Tecsel® Multicollar on the pipe and attach using the metal fixing brackets.

5. Drill with a 6 mm bit onto the supporting structure.

6. Fix the Tecsel® Multicollar to the supporting structure using wedge-type M6 anchors (recommended anchoring system, request further information).

### ASSEMBLE TWO MULTICOLLARS

To join two multicollars together, the fixing brackets must be positioned in opposition (one of them in the opposite position). Use the same fasteners between the collars as those used to attach them to the supporting structure.
2 - Tecsel® Collars

EI 120 - EI 180 - EI 240

Tecsel® Collars are made of a metal frame with intumescent graphite attached.

The fire-protection mechanism is the same as Tecsel® Multicollar. The intumescent graphite band expands when exposed to fire, filling the gap occupied by the plastic tube and preventing the transfer of smoke and fire to the fire compartment.
**APPLICATION AND USE**

*Tecsel® Collar* is closed by fastening the metal clip. The *Tecsel® Collar* is attached to the supporting structure by means of various holes and the corresponding screws or rivets.

1. Check the measurements of the pipe and open the *Tecsel® Collar*.
2. Place *Tecsel® Collar* as close as possible to the supporting structure.
3. Use the metal tab to adjust and to close the collar.
4. Screw the collar to the supporting structure using the appropriate fasteners.

**MODELS**

<table>
<thead>
<tr>
<th>TECSEL® COLLAR</th>
<th>Vertical and horizontal surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter (mm)*</td>
<td>Classification</td>
</tr>
<tr>
<td>82</td>
<td>EI 180</td>
</tr>
<tr>
<td>110</td>
<td>EI 240</td>
</tr>
<tr>
<td>160</td>
<td>EI 180</td>
</tr>
<tr>
<td>200</td>
<td>EI 240</td>
</tr>
<tr>
<td>250</td>
<td>EI 240</td>
</tr>
<tr>
<td>315</td>
<td>EI 240</td>
</tr>
</tbody>
</table>

*Other sizes available on request.*
3 - Tecsel® Bands

EI 120

Tecsel® Bands are fine graphite wrapped in a polyethylene cover.

The most efficient solution for pipes that run across irregular supporting structures.

The ease and simplicity of their installation lies in their versatility, allowing Tecsel® Bands to adapt perfectly to any situation that may arise during regular operations.
**APPLICATION AND USE**

*Tecsel® Bands* are wrapped around the pipe inside the supporting structure. The adhesive tape on the external surface is used to make any adjustments to the band.

---

**MODELS**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DIMENSIONS*</th>
<th>CLASSIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Tecsel® Band</em></td>
<td>110 mm</td>
<td>EI 120</td>
</tr>
<tr>
<td><em>Tecsel® Band</em></td>
<td>125 mm</td>
<td>EI 120</td>
</tr>
<tr>
<td><em>Tecsel® Band</em></td>
<td>160 mm</td>
<td>EI 120</td>
</tr>
</tbody>
</table>

* Other sizes available on request.

---

1. Plastic pipe running through various fire compartments.
2. Place the *Tecsel® Bands* around the pipe and check the pipe size.
3. Fit the band inside the supporting structure and secure in place with the adhesive tape.
4. Place the fire supporting structure and the *Tecsel® Band* remains inside the structure.
## SUMMARY OF SOLUTIONS

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Tecbor® Joint Paste ready to use</strong></td>
<td><strong>Tecbor® Joint paste ready to use</strong> is an ablative coating containing an aqueous dispersion of blinding polymers that produce an endothermic reaction in the event of a fire, thereby preventing the spread of fire and limiting the propagation of fire.</td>
</tr>
<tr>
<td><strong>1.1. Cable and penetration seals</strong></td>
<td>The combination of 145 kg/m³ of rock wool with <strong>Tecbor® Joint Paste</strong> creates a comprehensive sealing system for all types of installations.</td>
</tr>
<tr>
<td><strong>1.2. Cable tray protection</strong></td>
<td>The application of <strong>Tecbor® Joint Paste</strong> to metallic trays and to the cables themselves allows for the installation to function correctly, ensuring that electricity is continuously supplied and preventing short circuiting and shunts. It also serves to reduce propagation through the electrical cables.</td>
</tr>
<tr>
<td><strong>2. Tecsel® intumescent mastic</strong></td>
<td><strong>Tecsel® intumescent mastic</strong> is an intumescent sealant designed especially for joints in buildings, door frames and small openings in fire compartments.</td>
</tr>
<tr>
<td><strong>3. Tecsel® self-levelling silicone</strong></td>
<td><strong>Tecsel® self-levelling silicone</strong> is a fire sealant based on self-levelling and neutral curing silicone. It is designed for use on expansion joints on horizontal surfaces that are designed to bear substantial movement.</td>
</tr>
<tr>
<td><strong>4. Tecsel® Foam</strong></td>
<td><strong>Tecsel® Foam</strong> is a self-expanding, single-component polyurethane that is highly fire resistant.</td>
</tr>
<tr>
<td>PRODUCTS</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>5. Tecsel® Flexible Sealant</td>
<td><strong>Tecsel® Flexible Sealant</strong> is a combination of mineral fibres and intumescent graphite, with a protective plastic coating. This product is especially designed for expansion joints.</td>
</tr>
<tr>
<td>6. Tecsel® Lighting Cover and Tecsel® Socket Cover</td>
<td>Both solutions are a combination of graphite and mineral wool that swells when exposed to flames, sealing any gaps in the installation and therefore preventing the transfer of fire adjacent to it.</td>
</tr>
<tr>
<td>7. Tecsel® Grilles</td>
<td><strong>Tecsel® Grilles</strong> are PVC-encapsulated sheets of palusol. Palusol is made from sodium silicate hydrate, a small amount of organic material and is reinforced with fibres that protects the intermediate layer.</td>
</tr>
<tr>
<td>8. Tecsel® Pillows</td>
<td><strong>Tecsel® Pillows</strong> contain a combination of intumescent graphite and silicates, which is packaged in polyethylene cases coated with mineral fibre fabrics.</td>
</tr>
<tr>
<td>9. Tecsel® Multicollar</td>
<td>The <strong>Tecsel® Multicollar</strong> is a continuous band of punched stainless steel with an intumescent strip placed inside the rim. This band fits the tube as it allows the Multicollar to be adjusted to the exact measurements of the supporting structure.</td>
</tr>
<tr>
<td>10. Tecsel® Collar</td>
<td>The <strong>Tecsel® Collar</strong> consists of a metal frame inside which sheets of intumescent graphite are attached.</td>
</tr>
<tr>
<td>11. Tecsel® Bands</td>
<td><strong>Tecsel® Bands</strong> are fibres of graphite wrapped in a polyethylene cover.</td>
</tr>
</tbody>
</table>
DUNAMENTI TUZVEDELEM
PRODUCTS
**PS COLLAR**  
**– FIRE PROTECTION COLLAR IN METAL CASE**

Tested according to EN 1366-3:2005  
Test report: FIRES-FR-027-08-AUNE

**DESTINATION:**
- Fire protection of tubes of combustible material up to 400 mm diameter.
- Fire protection of tubes of insulated combustible material up to 250 mm diameter.
- Fire protection of tubes of insulated non-combustible material up to 160 mm diameter.
- Fire protection of tubes of combustible material in angle up to 160 mm diameter.

**DESCRIPTION OF THE PRODUCT:**
The PS fire protection collar consists of an outer case made of galvanized steel and flexible fire protection laminates. Laminates consists of fire-resistant filling materials, special graphite and additives mixed into thermoplastic materials. As a result of a temperature of the laminates over 140 °C they get swelled and lock the opening established in course of burning.

**TECHNICAL DATA:**

<table>
<thead>
<tr>
<th>PS collar</th>
<th>Tube diameter</th>
<th>Outer diameter of case</th>
<th>Inner diameter of case</th>
<th>Height</th>
<th>Number of fixings</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 50</td>
<td>50 mm</td>
<td>65 mm</td>
<td>52 mm</td>
<td>30 mm</td>
<td>3</td>
</tr>
<tr>
<td>PS 63</td>
<td>63 mm</td>
<td>77 mm</td>
<td>65 mm</td>
<td>30 mm</td>
<td>3</td>
</tr>
<tr>
<td>PS 75</td>
<td>75 mm</td>
<td>98 mm</td>
<td>77 mm</td>
<td>30 mm</td>
<td>4</td>
</tr>
<tr>
<td>PS 90</td>
<td>90 mm</td>
<td>112 mm</td>
<td>92 mm</td>
<td>30 mm</td>
<td>5</td>
</tr>
<tr>
<td>PS 110</td>
<td>110 mm</td>
<td>132 mm</td>
<td>112 mm</td>
<td>30 mm</td>
<td>6</td>
</tr>
<tr>
<td>PS 125</td>
<td>125 mm</td>
<td>150 mm</td>
<td>127 mm</td>
<td>30 mm</td>
<td>6</td>
</tr>
<tr>
<td>PS 160</td>
<td>160 mm</td>
<td>196 mm</td>
<td>163 mm</td>
<td>30 mm</td>
<td>8</td>
</tr>
<tr>
<td>PS 200</td>
<td>200 mm</td>
<td>248 mm</td>
<td>204 mm</td>
<td>60 mm</td>
<td>5</td>
</tr>
<tr>
<td>PS 225</td>
<td>225 mm</td>
<td>270 mm</td>
<td>228 mm</td>
<td>60 mm</td>
<td>6</td>
</tr>
<tr>
<td>PS 250</td>
<td>250 mm</td>
<td>298 mm</td>
<td>254 mm</td>
<td>60 mm</td>
<td>6</td>
</tr>
</tbody>
</table>

**THICKNESS OF BOLSTER AT PENETRATIONS (MINIMUM):**
- 120 mm concrete walls
- 100 mm drywall plate walls
- 150 mm solid brick and cell structure concrete walls
- 150 mm reinforced concrete and cell structure concrete ceilings

**WAY OF MOUNTING:**

1. The penetration has to be cleaned from dust and smooth contaminations.
2. The space between the wall and the tube has to be filled out with mineral wool or cement based mortar.
3. Collars have to be mounted at both sides of the wall, however, only from below from one side in case of ceilings.
4. Fixing the collars is to be done by holes on flappers of the case, holes on ceilings have to be drilled from below and they have to be fixed:
   - M6×60 size anchors in the wall socket up to 110 mm diameter, above 110 mm diameter M6×80 mm size anchors;
   - M6 bolts on mineral wool board or M5×50 mm size wooden screws;
   - M6 size wing anchors suitable for the drywall plate depending from thickness of drywall walls.
5. Penetrations have to be marked:
   - applicator company name
   - name of the applied materials
   - fire resistance limit
   - number of the certification
   - application date
• Gaps around the tube have to be filled with classified fire protection materials, mineral wool or cement-based mortar.
• Collars are to be fixed to the bolster with wall sockets and anchors made of steel.
• B = 120 for concrete walls
  B = 125 for drywall walls
  B = 150 for solid brick and cell structure concrete walls

SEALING OF NON-COMBUSTIBLE TUBES AT PENETRATIONS IN WALLS AND CEILINGS
Tested according to EN 1366-3-2005
SEALING OF COMBUSTIBLE MATERIAL TUBES PASSING IN ANGLE AT PENETRATION IN WALLS AND CEILINGS

Tested according to EN 1366-3:2009     Classification: FIRES-CR-139-12-AUPE

**EL 120**

- Gaps around the tube have to be filled with classified fire protection materials, mineral wool or cement-based mortar.
- Collars are to be fixed to the mineral wool board with wooden screws (min. diameter 5 mm, min. length 50 mm)
- $B = 120$ for concrete walls
  - $B = 125$ for drywall walls
  - $B = 150$ for solid brick and cell structure concrete walls

**For ordering:**

<table>
<thead>
<tr>
<th>Denomination of the product</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flange PS 50</td>
<td>50 mm</td>
</tr>
<tr>
<td>Flange PS 63</td>
<td>63 mm</td>
</tr>
<tr>
<td>Flange PS 75</td>
<td>75 mm</td>
</tr>
<tr>
<td>Flange PS 90</td>
<td>90 mm</td>
</tr>
<tr>
<td>Flange PS 110</td>
<td>110 mm</td>
</tr>
<tr>
<td>Flange PS 125</td>
<td>125 mm</td>
</tr>
<tr>
<td>Flange PS 160</td>
<td>160 mm</td>
</tr>
<tr>
<td>Flange PS 200</td>
<td>200 mm</td>
</tr>
<tr>
<td>Flange PS 225</td>
<td>225 mm</td>
</tr>
<tr>
<td>Flange PS 250</td>
<td>250 mm</td>
</tr>
</tbody>
</table>
DESTINATION:
- Fire protection sealing of tubes of combustible material up to 250 mm diameter.

DESCRIPTION OF THE PRODUCT:
The PS25 collar consists of intumescent flexible laminates, containing fire-resistant filling materials, special graphite and additives mixed into thermoplastic materials. As a result of a temperature of the laminates over 140 °C they get swelled and lock the opening established in course of burning.

TECHNICAL DATA:

<table>
<thead>
<tr>
<th>PS collar</th>
<th>Inner diameter of case</th>
<th>Outer diameter of case</th>
<th>Length</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS25 50</td>
<td>50 mm</td>
<td>52 mm</td>
<td>192 mm</td>
<td>60 mm</td>
</tr>
<tr>
<td>PS25 63</td>
<td>63 mm</td>
<td>65 mm</td>
<td>235 mm</td>
<td>60 mm</td>
</tr>
<tr>
<td>PS25 75</td>
<td>75 mm</td>
<td>77 mm</td>
<td>273 mm</td>
<td>60 mm</td>
</tr>
<tr>
<td>PS25 90</td>
<td>90 mm</td>
<td>92 mm</td>
<td>321 mm</td>
<td>60 mm</td>
</tr>
<tr>
<td>PS25 110</td>
<td>110 mm</td>
<td>112 mm</td>
<td>415 mm</td>
<td>60 mm</td>
</tr>
<tr>
<td>PS25 125</td>
<td>125 mm</td>
<td>127 mm</td>
<td>463 mm</td>
<td>60 mm</td>
</tr>
<tr>
<td>PS25 160</td>
<td>160 mm</td>
<td>162 mm</td>
<td>605 mm</td>
<td>60 mm</td>
</tr>
<tr>
<td>PS25 200</td>
<td>200 mm</td>
<td>203 mm</td>
<td>769 mm</td>
<td>60 mm</td>
</tr>
<tr>
<td>PS25 225</td>
<td>225 mm</td>
<td>228 mm</td>
<td>842 mm</td>
<td>60 mm</td>
</tr>
<tr>
<td>PS25 250</td>
<td>250 mm</td>
<td>253 mm</td>
<td>924 mm</td>
<td>60 mm</td>
</tr>
</tbody>
</table>

THICKNESS of BOLSTER AT PENETRATION (MINIMUM):
- B = 120 mm for concrete walls
- B = 100 mm for drywall walls
- B = 150 mm for solid brick and cell structure concrete walls
- B = 150 mm for reinforced concrete and cell structure concrete ceilings

WAY OF MOUNTING:

1. The penetration has to be cleaned from dust and smooth contaminations.
2. The PS25 collars have to be mounted in both sides of the wall, but only from below in case of ceilings, from one side.
3. The free space between the wall and the tube is to be filled out with mineral wool or cement-based mortar.
4. The sufficient size collars have to be wrapped on the tube, stuck by a band and slipped in the gap on the wall. The package contains stabilizing wedges, which can be used for placing and fixing the collar in the penetration.
5. The gap between the collar and the wall (up to 10 mm width) has to be filled out with Polylack K or Polylack KR or Polylack KG putty. In case of drywalls filling out may be performed by gypsum, too.
6. Penetrations have to be marked:
   - applicator company name
   - name of the applied materials
   - fire resistance limit
   - number of the certification
   - application date
SEALING OF PENETRATION OF TUBES OF COMBUSTIBLE MATERIAL IN WALLS AND CEILINGS

Tested according to EN 1366-3:2009          Classification: FIRES-CR-139-12-AUPE

• Gaps around the tube have to be locked by mineral wool or cement-based mortar.
• Gaps up to 10 mm between the wall and the collar are to be sealed with Polylack K or Polylack KR or Polylack KG fire protection putty.
• B = 120 mm for concrete walls
  B = 125 mm for drywall walls
  B = 150 mm for solid brick and cell structure concrete walls

For the order:

<table>
<thead>
<tr>
<th>Denomination of the product</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS Collar PS25 50</td>
<td>50 mm</td>
</tr>
<tr>
<td>PS Collar PS25 63</td>
<td>63 mm</td>
</tr>
<tr>
<td>PS Collar PS25 75</td>
<td>75 mm</td>
</tr>
<tr>
<td>PS Collar PS25 90</td>
<td>90 mm</td>
</tr>
<tr>
<td>PS Collar PS25 110</td>
<td>110 mm</td>
</tr>
<tr>
<td>PS Collar PS25 125</td>
<td>125 mm</td>
</tr>
<tr>
<td>PS Collar PS25 160</td>
<td>160 mm</td>
</tr>
<tr>
<td>PS Collar PS25 200</td>
<td>200 mm</td>
</tr>
<tr>
<td>PS Collar PS25 225</td>
<td>225 mm</td>
</tr>
<tr>
<td>PS Collar PS25 250</td>
<td>250 mm</td>
</tr>
</tbody>
</table>
DESTINATION:
- Sealing of gaps and construction dilatations
- Sealing of penetrations – cables, cable bundles, cable channels
- Sealing of combined penetration – cables, tubes and flexible hoses
- Sealing of non-combustible tubes and non-combustible tubes with insulations

BASE THICKNESS (MINIMUM):
- 120 mm – concrete walls
- 100 mm – walls made of drywall plates
- 150 mm – walls made of solid brick and cell structure concrete
- 150 mm – ceilings made of reinforced concrete and cell structure concrete

DESCRIPTION OF THE PRODUCT:
The POLYLACK F is an intumescent paint, which is based on antipyrens, gas- and carbon forming additives as well as water dispersions of synthetic resins. Applied and dried paints form foamy-carbon layer in case of fire due to the high temperature, which is able to stop the burning of the polymer insulation layer at an early stage, preventing the spreading of flames on the protected surface of the penetration.

DESCRIPTION OF THE PRODUCT:
The POLYLACK K and KR are intumescent putties, in form of a dense mortar. After application, the paste forms a foamy-carbon layer due to the high temperature which is able to stop the burning of the polymer insulation layer at an early stage, preventing the spreading of flames at the sealed places. The destination of the putty is to fill out of micro- and macro cavities, lacks, unevenness, gaps and dilatations, which may be established in course of the installation of fire protection sealing of cables, cable trays and combined penetrations.

DESCRIPTION OF THE PRODUCT:
- POLYLACK F – fire protection intumescent paint:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>White</td>
</tr>
<tr>
<td>Density</td>
<td>1312 kg/m³</td>
</tr>
<tr>
<td>Coating formation time</td>
<td>appr.. 120 min.</td>
</tr>
<tr>
<td>Full drying</td>
<td>24 hours</td>
</tr>
<tr>
<td>Temperature resistance</td>
<td>from -40°C to +120°C</td>
</tr>
<tr>
<td>Swelling</td>
<td>1:25</td>
</tr>
<tr>
<td>Thickness of dry layer</td>
<td>0.5 mm</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>from +5°C to +40°C</td>
</tr>
<tr>
<td>Shelf time</td>
<td>12 months from the date of production</td>
</tr>
</tbody>
</table>

DESCRIPTION OF THE PRODUCT:
- POLYLACK K és KR – fire protection intumescent putty:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>White</td>
</tr>
<tr>
<td>Density</td>
<td>K - 1346 kg/m³, KR - 1377 kg/m³</td>
</tr>
<tr>
<td>Coating formation time</td>
<td>appr. 30 min.</td>
</tr>
<tr>
<td>Full drying</td>
<td>24 – 72 hours</td>
</tr>
<tr>
<td>Temperature resistance</td>
<td>from 40°C to 120°C</td>
</tr>
<tr>
<td>Swelling</td>
<td>1:10</td>
</tr>
<tr>
<td>Depth to be filled</td>
<td>25 mm</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>from +5°C to +40°C</td>
</tr>
<tr>
<td>Shelf time</td>
<td>12 months from the date of production</td>
</tr>
</tbody>
</table>
• The unevenness between walls, fittings and the mineral wool have to be sealed with Polylack K or KR putty.
• The collars have to be fixed to the wall and/or ceiling with threaded bolts made of steel.
• B = 120 concrete walls
  B = 100 drywall walls
  B = 150 solid brick and cell structure concrete walls

SEALING OF PENETRATION OF CABLES AND CABLE BUNDLES, CABLE TRAYS IN WALLS AND CEILINGS

1. The inner edge of penetration has to be cleaned from dust and smooth contaminations.
2. The cables and cable trays in the penetrations have to be painted with Polylack F paint.
3. The mineral wool, with min. 125 kg/m³ density and 60 mm thickness have to be painted on both sides with Polylack F paint – paint thickness after drying should be 0.5 mm. If you are using the original Dunamenti wool, called Dunaboard this action may be left out.
4. The sufficient sized wool pieces have to be cut out and they have to be inserted into the penetrations.
5. The cables and cable trays are to be painted with Polylack F paint in a length of 150 mm from the wall and it is to be painted only once so that the paint should create a homogeneous, even surface.
6. At combustible tubes up to a diameter of 160 mm PS 25 collars have to be located between the tube and the wall-edge and pushed till the surface of the wool and fixed with fire protection putty. In the case of PS collars those should be located on both sides of the wall but only from below on the ceiling. The collars have to be fixed with bolts having M6 threads or wood screws of the size M5×50 mm.
7. Combustible tubes up to 50 mm diameter can also be sealed with Polylack KG putty. For this purpose the wool has to be removed in its full thickness in form of a ring, round in a width of 20 mm. The gap established on this way has to be sealed by a putty knife or pusher-pistol with Polylack KG intumescent putty at the full thickness of the wool (60 mm).
8. The unevenness between walls, fittings and the mineral wool has to be sealed with Polylack K or KR putty.
9. Penetrations have to be marked:
   • applicator company name
   • name of the applied materials
   • fire resistance limit
   • number of the certification
   • application date
• The unevenness between walls, fittings and the mineral wool has to be sealed with Polylack K or KR putty.
• B = 120 concrete walls
B = 100 drywall walls
B = 150 solid brick and cell structure concrete walls

WAY OF MOUNTING AT CABLE PENETRATIONS:

1. The inner edge of penetration has to be cleaned from dust and smooth contaminations.
2. The cables and cable trays in the penetrations have to be painted with Polylack F paint.
3. The mineral wool, with min. 125 kg/m³ density and 60 mm thickness have to be painted on both sides with Polylack F paint – paint thickness after drying should be 0.5 mm. If you are using the original Dunamenti wool, called Dunaboard this action may be left out.
4. The sufficient sized wool pieces have to be cut out and they have to be inserted into the penetrations.
5. The cables and cable trays are to be painted with Polylack F paint in a length of 150 mm from the wall and it is to be painted only once so that the paint should create a homogeneous, even surface.
6. The unevenness between walls, fittings and the mineral wool has to be sealed with Polylack K or KR putty.
7. Penetrations have to be marked:
   - applicator company name
   - name of the applied materials
   - fire resistance limit
   - number of the certification
   - application date
   - applicator signature
• Collars have to be fixed to the walls/ceilings with threaded bolts made of steel.
• The unevenness between walls, fittings and mineral wool is to be sealed with Polylack K or KR putty.
• A = max. ø 160 mm, for steel tubes
  A = max. ø 75 mm , for copper tubes
• B = 120 for concrete walls
  B = 100 for drywall walls
  B = 150 for solid brick and cell structure concrete walls

**SEALING OF COMBINED PENETRATIONS IN THE WALL**

Tested according to EN 1366-3:2009
Classification: FIRES-JR-052-12-NURE

1. The inner edge of penetration has to be cleaned from dust and smooth contaminations.
2. The cables, cable trays, tubes and flexible hoses in the penetrations have to be painted with Polylack F paint.
3. The mineral wool, with min. 125 kg/m³ density and 60 mm. thickness have to be painted on both sides with Polylack F paint – paint thickness after drying should be 0.5 mm. If you are using the original Dunamenti wool, called Dunaboard this action may be left out.
4. The sufficient sized wool pieces have to be cut out and they have to be inserted into the penetrations.
5. The cables and cable trays are to be painted with Polylack F paint in a length of 150 mm from the wall and it is to be painted only once so that the paint should create a homogeneous, even surface.
6. At combustible tubes up to a diameter of 160 mm PS collars have to be mounted at both sides of the wool. These are to be fixed with bolts of M6 thread or wooden screws of the size M5×50 mm.
7. Tubes up to 50 mm may also be sealed with Polylack KG putty. For this purpose the wool has to be removed in a depth of 25 mm in a ring form, round, in a width of 20 mm on both sides. The gap established on this way has to be sealed by putty knife or pusher-pistol with Polylack KG intumescent putty. Tubes are to be painted with Polylack F paint at a length of 150 mm from the wall, only once, so that an even, homogeneous layer should be created.
8. Flexible tubes up to 45 mm may also be sealed with Polylack KG putty. For this purpose the wool has to be removed in a depth of 25 mm in a ring form, round, in a width of 20 mm on both sides. The gap established on this way has to be sealed by putty knife or pusher-pistol with Polylack KG intumescent putty. Tubes are to be painted with Polylack F paint at a length of 150 mm from the wall, only once, so that an even, homogeneous layer should be created.
9. The insulated non-combustible tubes in penetration may to sealed with Polylack KG putty. For this purpose the wool has to be removed in its entirety thickness in a ring form, round, in a width of 20 mm. The gap established this way has to be sealed by putty knife or pusher-pistol with Polylack KG intumescent putty. Tubes are to be painted with Polylack F paint at a length of 150 mm from the wall, only once, so that an even, homogeneous layer should be created.
10. The unevenness between walls, fittings and the mineral wool has to be sealed with Polylack K or KR putty.
11. Penetrations have to be marked:
   – applicator company name
   – fire resistance limit
   – number of the certification
   – application date
   – name of the applied materials
   – applicator signature

**MOUNTING OF DOUBLE-LAYER COMBINED PENETRATIONS MADE OF MINERAL WOOL:**

- POLYLACK F, K, KR and KG – FIRE PROTECTION INTUMESCENT MATERIALS
- EI 90/EI 120
- Tested according to EN 1366-3:2009
- Classification: FIRES-JR-052-12-NURE
SEALING OF PENETRATIONS OF STEEL TUBES IN WALLS AND CEILINGS:
Tested according to EN 1366-3:2009  Classification: FIRES-JR-052-12-NURE

- The unevenness between tubes, walls, accessories and the mineral wool has to be sealed with Polylack K or KR putty.
- B = 120 concrete walls
  - B = 100 drywall walls
  - B = 150 solid brick and cell structure concrete walls

WAY OF MOUNTING AT STEEL TUBES PENETRATION:

1. The inner edge of penetration has to be cleaned from dust and smooth contaminations.
2. The tubes in the penetrations have to be painted with Polylack F paint.
3. The mineral wool, with min. 125 kg/m³ density and 60 mm. thickness have to be painted on both sides with Polylack F paint – paint thickness after drying should be 0.5 mm. If you are using the original Dunamenti wool, called Dunaboard this action may be left out.
4. The sufficient sized wool pieces have to be cut out and they have to be inserted into the penetrations.
5. Tubes are to be painted with Polylack K paint in a length of 150 mm from the wall and those are to be painted only once so that the paint should create a homogeneous, even surface in thickness 0.5 mm. The unevenness between walls, fittings and the mineral wool has to be sealed with Polylack K or KR putty.
6. Penetrations have to be marked:
   - applicator company name
   - name of the applied materials
   - fire resistance limit
   - number of the certification
   - application date
   - applicator signature
SEALING OF PENETRATIONS OF INSULATED NON-COMBUSTIBLE TUBES IN WALLS AND CEILINGS:
Tested according to EN 1366-3:2009 Classification: FIRES-JR-052-12-NURE

- The unevenness between tubes, walls, accessories and the mineral wool has to be sealed with Polylack K or KR putty.
- $A = \max_\circ \ 160 \text{ mm}$, for steel tubes
- $A = \max_\circ \ 75 \text{ mm}$, for copper tubes
- $B = 120 \text{ concrete walls}$
- $B = 100 \text{ drywall walls}$
- $B = 150 \text{ solid brick and cell structure concrete walls}$

WAY OF MOUNTING AT THE INSULATED NON-COMBUSTIBLE TUBE PENETRATIONS:

1. The inner edge of penetration has to be cleaned from dust and smooth contaminations.
2. The mineral wool, with min. $125 \text{ kg/m}^3$ density and 60 mm thickness have to be painted on both sides with Polylack F paint – paint thickness after drying should be 0.5 mm. If you are using the original Dunamenti wool, called Dunaboard this action may be left out.
3. The sufficient sized wool pieces have to be cut out and they have to be inserted into the penetrations.
4. The wool has to be removed around the insulation in the thickness of 25 mm on both sides in a width of 20 mm.
5. The established gap is to be sealed by putty knife or pusher-pistol with Polylack KG intumescent putty.
6. The unevenness between walls and the mineral wool is to be sealed with Polylack K or KR putty.
7. Penetrations have to be marked:
   - applicator company name
   - name of the applied materials
   - fire resistance limit
   - number of the certification
   - application date
   - applicator signature
• B = 120 concrete walls
  B = 125 drywall walls
  B = 150 solid brick and cell structure concrete walls

SEALING OF PENETRATIONS OF CONSTRUCTION GAPS IN WALLS AND CEILINGS:
Tested according to EN 1366-4:2006+2010    Test report: FIRES-FR-131-14-AUNE

WAY OF MOUNTING IN GAPS AND DILATATIONS:

1. The inner edge of penetration has to be cleaned from dust and smooth contaminations.

2. The mineral wool, with min. 125 kg/m³ density and 60 mm thickness have to be painted on both sides with Polylack F paint – paint thickness after drying should be 0.5 mm. If you are using the original Dunamenti wool, called Dunaboard this action may be left out.

3. The sufficient seized wool have to be cut out and inserted in the penetration at both sides of the wall. These inserted parts are to be painted with Polylack F paint.

4. Small gap between the inserted mineral wool parts and the edge of the penetration is to be filled with Polylack K or Polylack KR putty.

5. Penetrations have to be marked:
   – applicator company name
   – name of the applied materials
   – fire resistance limit
   – number of the certification
   – application date
   – applicator signature
**DESTINATION:**
- Fire protection sealing of cables and cable bundles up to a diameter of 100 mm.
- Sealing of non-combustible tubes with insulations [see description at Polylack F paint].
- Sealing of combustible tubes [see description at Polylack F paint].
- Sealing of cables in flexible tubes [see description at Polylack F paint].

**DESCRIPTION OF THE PRODUCT:**
The POLYLACK KG is a fire protection intumescent putty in the form of dense mortar. After application of the putty, due to the high temperature, it shall be swelling, multiplying its own volume. On this way it is creating a protecting layer which shall lock the penetration and stops burning.

**THICKNESS OF BASE (MINIMUM):**
- 150 mm – solid brick and cell structure concrete walls
- 150 mm – ceilings made of reinforced steel and cell structure concrete

**WAY OF MOUNTING:**
1. The penetration has to be cleaned from dust and smooth contaminations.
2. The Paste has to be pushed by a putty knife into the gap between the cables and the wall as well as between the cables, or it has to be pressed from a tube on the entire thickness of the wall and/or the ceiling in max. 150 mm thickness. In case of a base thicker than defined as maximum penetration has to be filled from both sides in the thickness 75-75 mm each.
3. The paste surface has to be smoothed with a putty knife or a wet brush in order to achieve an aesthetic surface.
4. The penetration has to be marked.
   - applicator company name
   - name of the applied materials
   - fire resistance limit
   - number of the certification
   - application date
   - applicator signature
SEALING OF PENETRATIONS OF CABLES AND CABLE BUNDLES IN WALLS AND CEILINGS

- B = 120 concrete walls
- B = 125 drywall walls
- B = 150 solid brick and cell structure concrete walls

POLYLACK KG – FIRE PROTECTION INTUMESCENT PUTTY
**FUNCTION:**

- Fire protection sealing of construction dilatations up to 50 mms.

**DESCRIPTION OF THE PRODUCT:**

The Dunaseal sealing unit consists of hardly combustible single- or double layer elastic sponge having 2 or 3 intumescent laminated fire protection strips which create a volume growth in case of fire on this way forming barriers for the fire by filling out the gaps and construction dilatations. The location of units in the gap allows to establish a quick and efficient fire protection sealing in the wall or in the ceiling or within the gaps between the junction of two construction elements. This system is very flexible and thanks to this flexibility it makes the independent moving of the construction elements possible, beside keeping full airtightness.

**TECHNICAL DATA:**

Width: 35 mm (1 layer of sponge and 2 layers of intumescent laminated strips)
Width: 67.5 mm (2 layers of sponge and 3 intumescent laminated strips)

**SUBSTRATE THICKNESS (MINIMUM):**

- 120 mm – Concrete walls
- 125 mm – Walls made of drywall plates
- 150 mm – Walls built of solid brick and cell-structure concrete walls
- 150 mm – Ceilings built of reinforced concrete and cell-structure concrete

**THE WAY OF MOUNTING:**

The Dunaseal units serve for the sealing of gaps and construction dilatations up to 50 mm width. Mineral wool with min. 50 kg/m$^3$ density has to be pushed into the inside of the gap leaving a 30 mm free space where the Dunaseal units have to be inserted. For gaps with 10-25 mm width Dunaseal 35 units are to be used, for gaps of 25-50 mm. the Dunaseal 67 units are to be applied. For ceilings, Dunaseal units are to be mounted from below. Two Dunaseal units have to mounted into the wall, from both sides. Dunaseal units are to be mounted in a way that they should face the laminated layer.

1. Penetrations have to be cleaned from dust and smooth contaminations.
2. Mineral wool of min. 50 kg/m$^3$ density have to be pushed into the gaps, leaving 30 mm free space.
3. The unit has to be squeezed and inserted into the space left free, the intumescent layer has to face the wall.
4. Units can be inserted into the wall from both sides, however, they need to be inserted from below in case of ceilings.
5. Penetrations have to be marked:
   - applicator company name
   - name of the applied materials
   - fire resistance limit
   - number of the certification
   - application date
   - applicator signature

Tested according to EN 1366-4:2006+2010
Test report: FIRES-FR-131-14-AUNE
SEALING OF GAPS AND CONSTRUCTION DILATATIONS IN WALLS AND CEILINGS WITH DUNASEAL UNITS

- **EI 120**

<table>
<thead>
<tr>
<th>Denomination of the product</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dunaseal 35</td>
<td>1 m</td>
</tr>
<tr>
<td>Dunaseal 67</td>
<td>1 m</td>
</tr>
</tbody>
</table>

For ordering:

- B = 120 Concrete walls
- B = 125 Drywall walls
- B = 150 For walls built of solid brick and cell-structure concrete walls
PURPOSE:
Increasing the fire-resistance of steel supporting structures up to a limit value of 60 min., with respect to the critical temperature.

USE:
1. Surface preparation:
   iron and steel: the surface should be dry, cleaned from contamination, and coated with anti-corrosion primer; suggested primer: a generally used anti-corrosion primer, or a primer tested and approved by the producer.
   galvanized surface: the surface should be dry, cleaned from contamination, and coated with a primer designed for galvanized surfaces and approved by the producer.

2. Application:
   with airless sprayer: nozzle 0,48-0,63 mm; 1500-2000 µm wet paint/layer
   with brush/roller: 300-500 µm wet paint/layer
   after homogenization with a mixer machine the Polylack A paint should be applied to the surface undiluted, or by adding max 5% thinner; suggested thinner type: aromatic

3. Average drying time at 23 oC, with 300 µm layer-thickness:
   - dust-dry after 1 hour
   - touch-safe and treatable after 24 hours
   - can be painted with itself after 8 hours; with coating paint after 24 hours

TECHNICAL DESCRIPTION:
- **POLYLACK A**
  - Colour: White
  - Solid content: 76 +/- 2 m/m%
  - Density: 1,35 +/- 0,06 g/cm
  - Shelf time: 12 months from the date of production
  - Approvals: EME A-19/2001, FIRES JR-043-12-NURE1

PURPOSE:
Increasing the fire-resistance of steel supporting structures up to a limit value of 90 min., with respect to the critical temperature.

USE:
1. Surface preparation:
   iron and steel: the surface should be dry, cleaned from contamination, and coated with anti-corrosion primer; suggested primer: a generally used anti-corrosion primer, or a primer tested and approved by the producer.
   galvanized surface: the surface should be dry, cleaned from contamination, and coated with a primer designed for galvanized surfaces and approved by the producer.

2. Application:
   with airless sprayer: nozzle 0,48-0,63 mm; 800-1000 µm wet paint/layer
   with brush/roller: 300-500 µm wet paint/layer
   after homogenization with a mixer machine the Polylack W paint should be applied to the surface undiluted, or by adding max 3% thinner; suggested thinner type: aromatic

3. Average drying time at 23 oC, with 250 µm layer-thickness:
   - dust-dry after 1 hour
   - touch-safe and treatable after 24 hours
   - can be painted with itself after 8 hours; with coating paint after 24 hours

TECHNICAL DESCRIPTION:
- **POLYLACK W**
  - Colour: White
  - Solid content: 68 +/- 2 m/m%
  - Density: 1,34 +/- 0,06 g/cm
  - Shelf time: 12 months from the date of production
PURPOSE:
Increasing the fire-resistance of steel supporting structures up to limit values R30-R240 by applying an 8 to 60 mm thick mortar layer.

DESCRIPTION:
The POLYPLAST G is a fire protection gypsum mortar for steel structures, which can be applied on the surfaces - after mixing with water - with a plaster machine.

USE:
1. Surface preparation: the surface should be dry, cleaned from contamination, and coated with a one-component, anti-corrosion primer (50 µm); suggested primer: a generally used anti-corrosion primer.

2. Application: with small and medium performance machines (5-15 l/min spraying capacity): one layer up to 25 mm coating thickness; two layers above 25 mm coating thickness - with 30-60 min. drying time before applying second layer.

3. Drying time: average drying time at 20 ºC for every layer-thickness:
   - hardened but wet after 1 hour
   - touch-safe and treatable after 24 hours
   - entirely dry after 30 days.
   Maximal shrinkage after complete drying: 5%.

TECHNICAL DESCRIPTION:

<table>
<thead>
<tr>
<th>Colour</th>
<th>Grey, granular powder forms a rough sprayed surface when applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>400-420 kg/m³</td>
</tr>
<tr>
<td>Mixing proportion</td>
<td>1 kg dry mortar + 1 litre water</td>
</tr>
<tr>
<td>Usable</td>
<td>max 2,5 hours at 20 ºC after mixing</td>
</tr>
<tr>
<td>Shelf time</td>
<td>12 months from the date of production</td>
</tr>
</tbody>
</table>
| Approvals    | ÉME A-20/2010
               | FIRES CR-144-11-AUPE2                                         |
PURPOSE:
To provide fire protection, fire retarding abilities to interior wooden surfaces, wooden support constructions.

USE:
1. Surface preparation:
   the surface should be dry, cleaned from contamination, and coated with a one-component, anti-corrosion primer (50 µm); suggested primer: a generally used anti-corrosion primer.

2. Application:
   after mixing the paint should be applied with a brush, roller or machine sprayer; environment temperature should be between 5 °C and 40 °C

3. Thinner:
   the product does not require thinner, but 1-3% aromatic thinner can be added, if necessary (e.g. when working with air atomisation method)

4. Drying time:
   average drying time at 20 °C:
   - dust-dry after 1 hour
   - entirely dry after 24 hours

5. Note:
   the product may not be used on wooden surfaces of toys, beehives, forcing- and glasshouses, and of any other object in touch with food; not usable outdoors, and in areas subject to condensation, dampening or direct rain.

TECHNICAL DESCRIPTION:

<table>
<thead>
<tr>
<th>Colour</th>
<th>Light-yellowish, opalescent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid content</td>
<td>64 +/- 2 m/m%</td>
</tr>
<tr>
<td>Density</td>
<td>1,14 +/- 0,06 g/cm²</td>
</tr>
<tr>
<td>Required amount</td>
<td>0,3 kg/m²</td>
</tr>
<tr>
<td>Shelf time</td>
<td>12 months from the date of production</td>
</tr>
<tr>
<td>Approvals</td>
<td>ÉME A-163/2011</td>
</tr>
</tbody>
</table>

PURPOSE:
To provide fire protection, fire retarding abilities to interior wooden surfaces, wooden support constructions.

USE:
1. Surface preparation:
   the surface should be dry, cleaned from contamination, and coated with a one-component, anti-corrosion primer (50 µm); suggested primer: a generally used anti-corrosion primer.

2. Application:
   after mixing the paint should be applied with a brush, roller or machine sprayer; environment temperature should be between 5 °C and 40 °C
   use under 5 °C is not recommended!

3. Thinner:
   the product is ready-to-use, but 1-3% water can be added, if necessary (e.g. when working with air atomisation method)

4. Drying time:
   average drying time at 20 °C:
   - dust-dry after 1 hour
   - entirely dry after 24 hours

5. Note:
   the product may not be used on wooden surfaces of toys, beehives, forcing- and glasshouses, and of any other object in touch with food; not usable outdoors, and in areas subject to condensation, dampening or direct rain.

TECHNICAL DESCRIPTION:

<table>
<thead>
<tr>
<th>Colour</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid content</td>
<td>67 +/- 2 m/m%</td>
</tr>
<tr>
<td>Density</td>
<td>1,25 +/- 0,06 g/cm²</td>
</tr>
<tr>
<td>Required amount</td>
<td>0,3 kg/m²</td>
</tr>
<tr>
<td>Shelf time</td>
<td>12 months from the date of production</td>
</tr>
<tr>
<td>Approvals</td>
<td>ÉME A-381/2005</td>
</tr>
</tbody>
</table>
FIRE PROTECTION SYSTEMS

- smoke and heat exhaust systems
- fire ventilation systems
- fire protection of building structures