1. STEEL STRUCTURE

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, the gradual 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.

mercor tecresa® has conducted numerous tests with **Tecbor®** according to **UNE EN 13381-4**, standard, in which is determined the contribution of fire protection of the board when we protect steel structural elements, either on beams, columns or bearing 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 specified design temperatures.

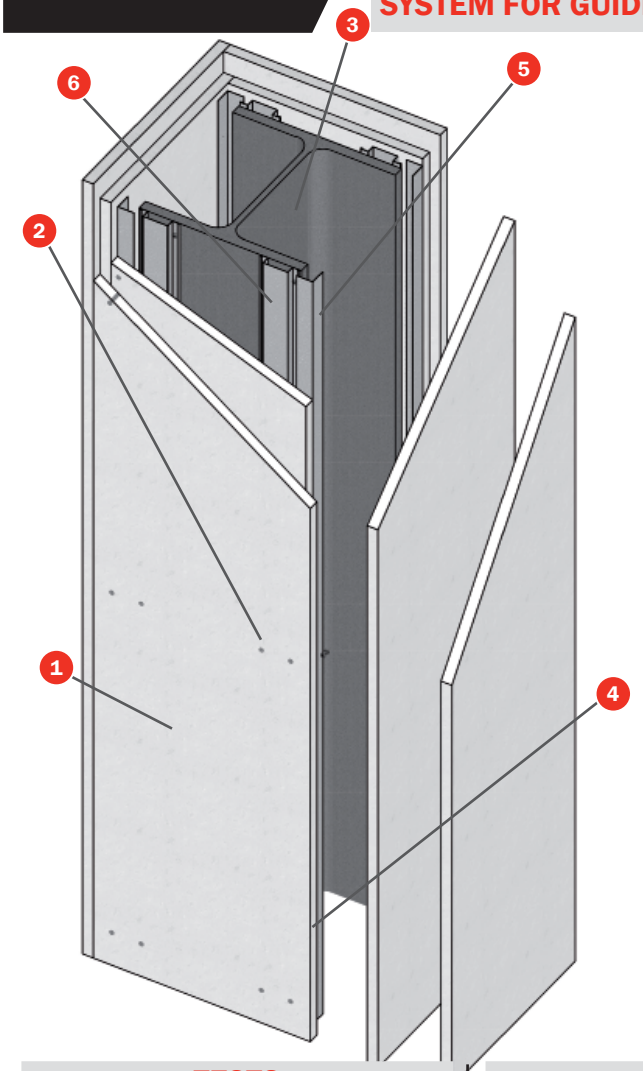
TECBOR® BOARDS

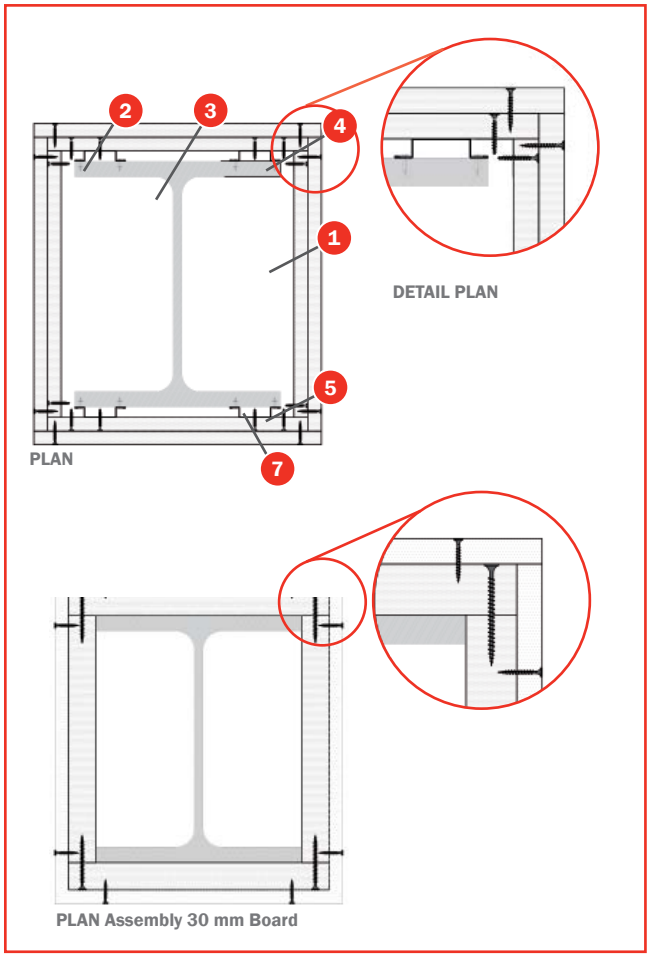
CONSTRUCTIVES SOLUTIONS

mercor tecresa®

METALLIC STRUCTURE PROTECTION. **COLUMNS.**

SYSTEM FOR GUIDE RUNNING LENGTHWISE TO THE SECTION.COLUMNS.





TESTS

Standard: ENV 13381-4

Laboratory: TECNALIA

Test Nº: 058417-002

SOLUTION

1. **Tecbor®** Boards.
2. Self-tapping screw (size according to board).
3. Steel columns.
4. **Tecbor®** joint paste.
5. 30x30x0,6 mm angle section.
6. 45x15x0,6 mm omega.

DESCRIPTION OF ASSEMBLY

Fix 45x15x0,6 mm omega profiles to the outer side of the metal profile's flange to be protected with steel nails every 725 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.Assemble the strips

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

NOTE: If the protection procedure comprises Tecbor® boards with a thickness equal to or greater than 30 mm, they may be joined without auxiliaries using 5 x 80 mm screws at intervals of 250 mm.

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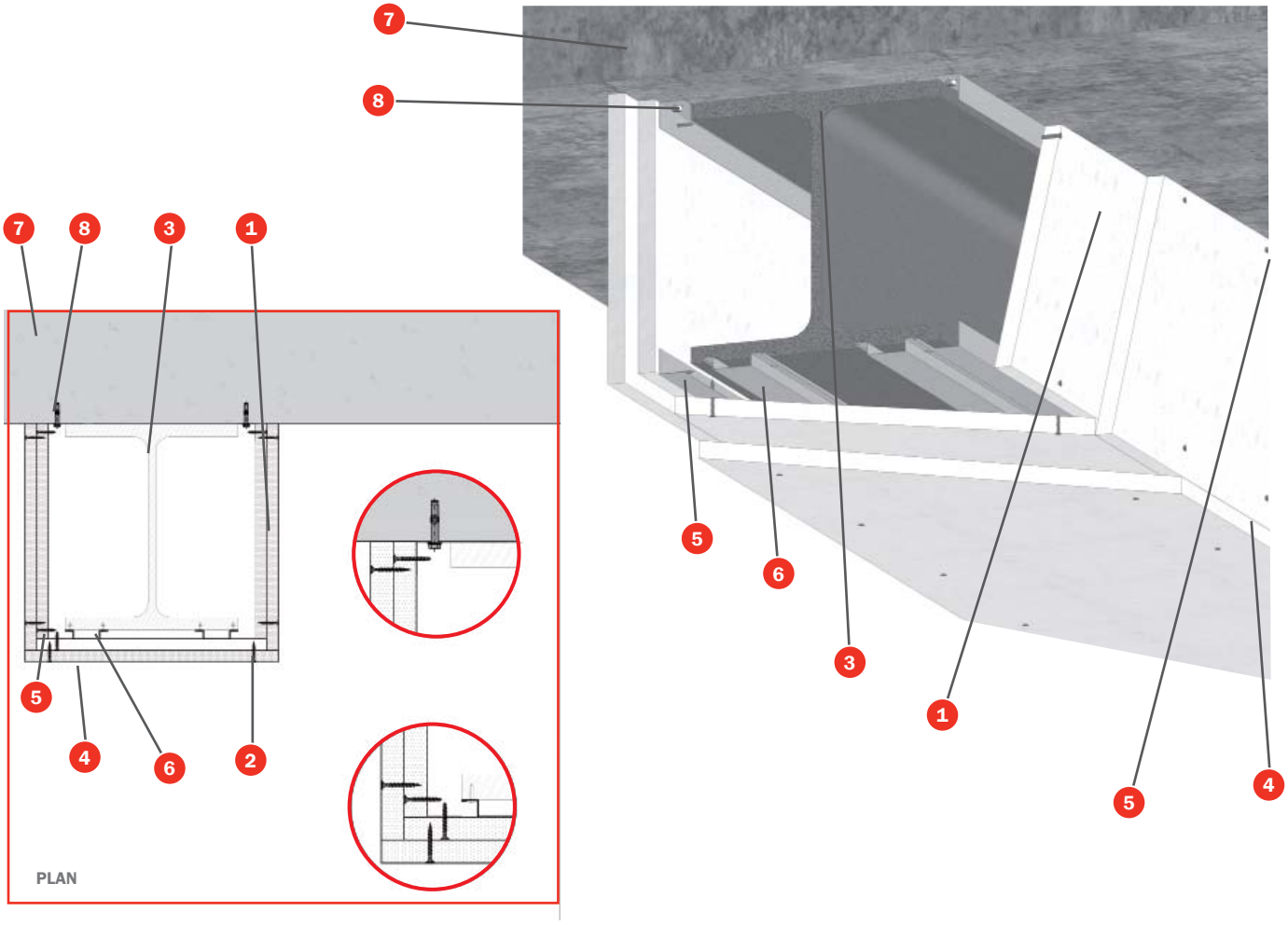
METAL STRUCTURE PROTECTION. **BEAMS.**

SYSTEM FOR GUIDE RUNNING LENGTHWISE TO THE SECTION . BEAMS.



TESTS

Standard: ENV 13381-4

Laboratory: TECNALIA

Test Nº: 058417-002

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 profiles to the outer side of the metal profile's flange to be protected with steel nails every 725 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..

NOTE: If the protection procedure comprises Tecbor® boards with a thickness equal to or greater than 30 mm, they may be joined without auxiliaries using 5 x 80 mm screws at intervals of 250 mm.

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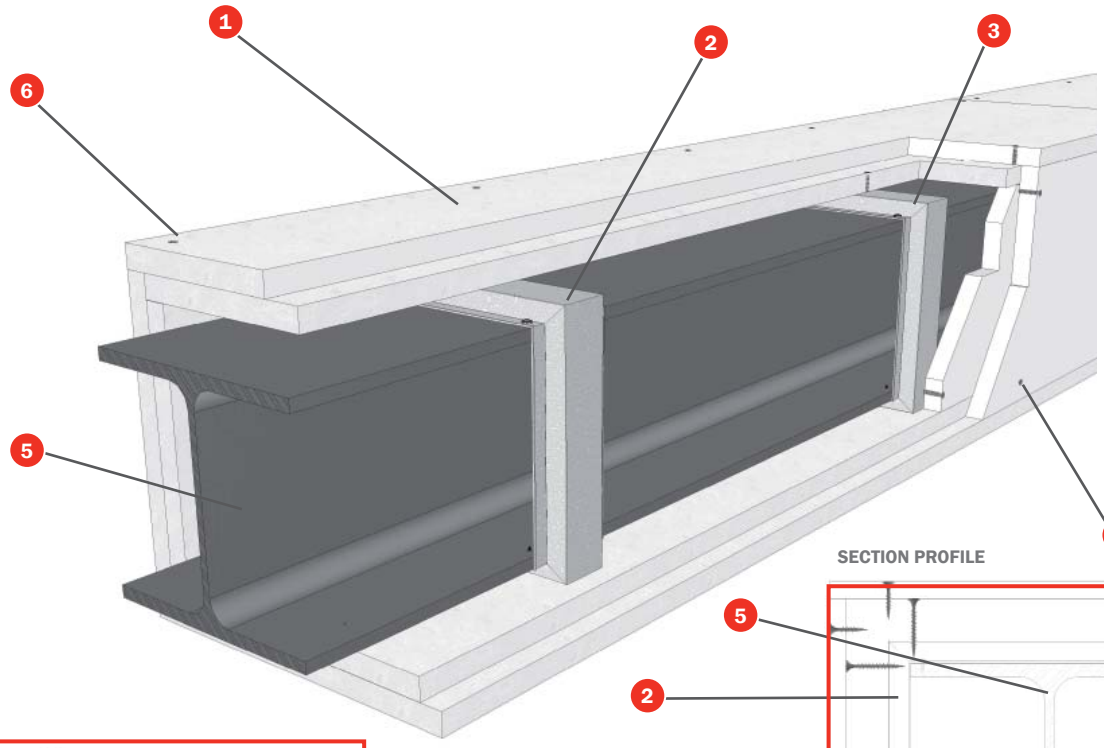
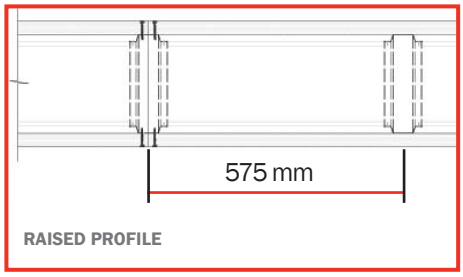
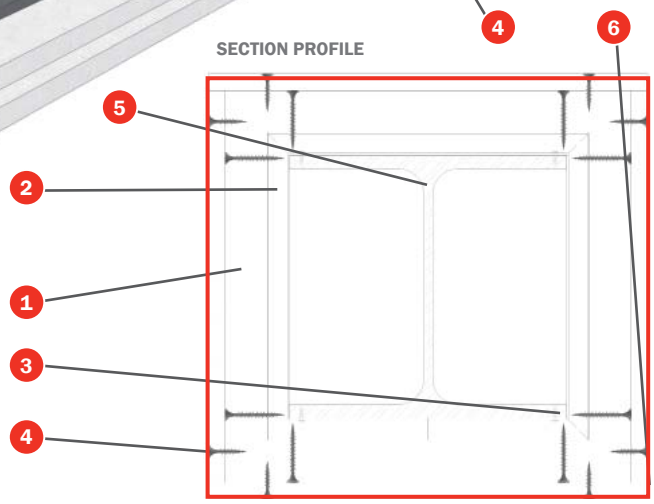
METAL STRUCTURE PROTECTION.

SYSTEM FOR GUIDE TO FORM A RING.







TESTS

Standard: ENV 13381-4

Laboratory: TECNALIA

Test Nº: 058417-002

SOLUCIÓN

1. **Tecbor®** Boards.
2. 45x15x0,6 mm omega.
3. X-dnl type nail or similar.
4. Self-tapping screw (size according to board)..
5. Profile.
6. **Tecbor®** joint paste.

DESCRIPTION OF ASSEMBLY

Attach the 45 x 15 x 0.6 mm omega profiles to the outer side of the flange of the metal profile to be protected using steel nails, and form a ring around it. The rings will be separated at intervals of a maximum of 575 mm. They will be placed in such a way that the horizontal joints between plates overlap on an omega profile.

Attach the anchored **Tecbor®** plates to the omega profiles using self-tapping screws every 250 mm

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

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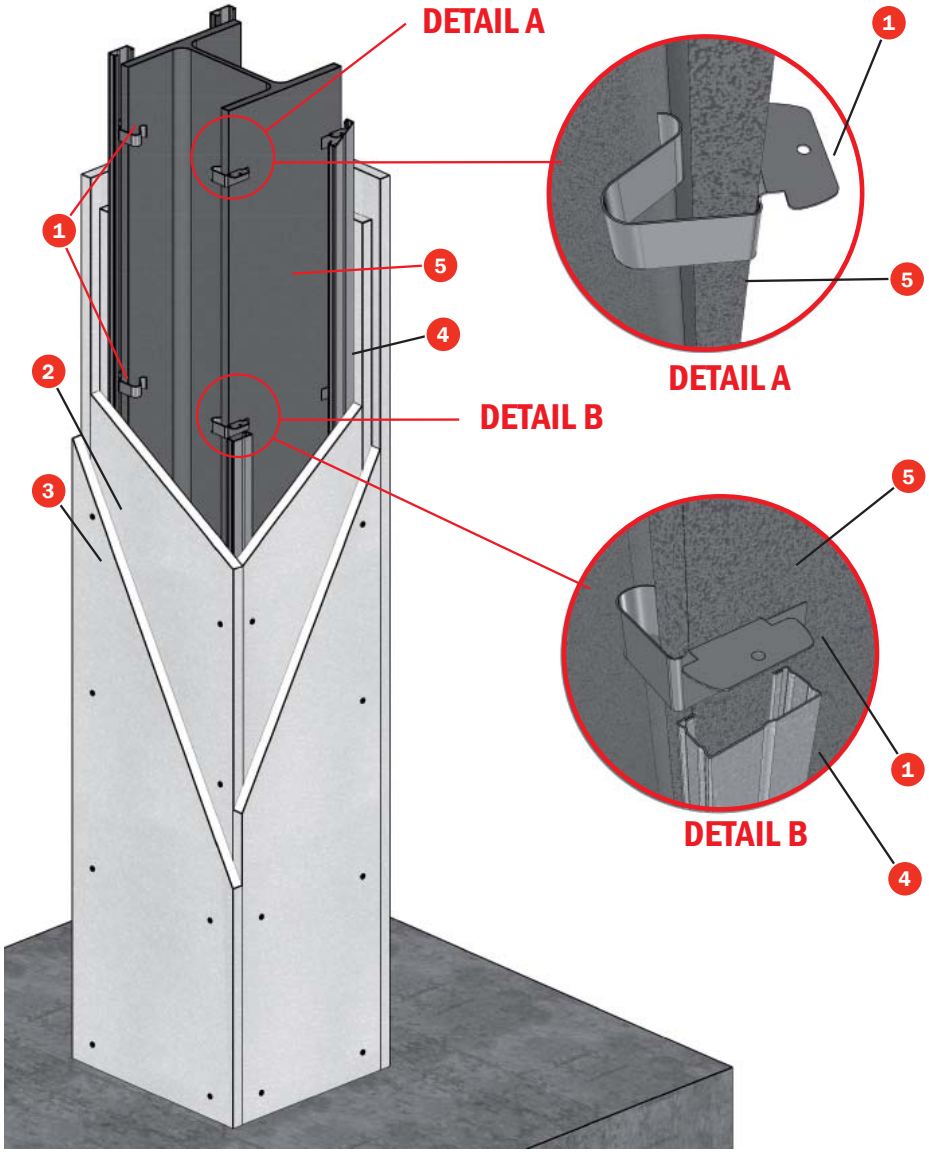
METAL STRUCTURE PROTECTION.

TECBOR CLIP SISTEM



TESTS

Standard: ENV 13381-4

Laboratory: TECNALIA

Test Nº: 058417-002

SOLUTION

1. Clip **Tecbor®**.
2. **Tecbor®** board.
3. Self-tapping screw (size according to board).
4. Profile TC 45x18x0,6 mm
5. Viga o Pilar tipo.

DESCRIPTION OF ASSEMBLY

Attach the **Tecbor®** clip to the outer side of the metal profiles to be protected, separated at intervals of no more than 500 mm.

Attach the 45 x 18 x 0.6 mm TC roof profiles to the **Tecbor®** clip by pressure.

Attach the anchored **Tecbor®** plates to the TC profiles using self-tapping screws every 250 mm

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

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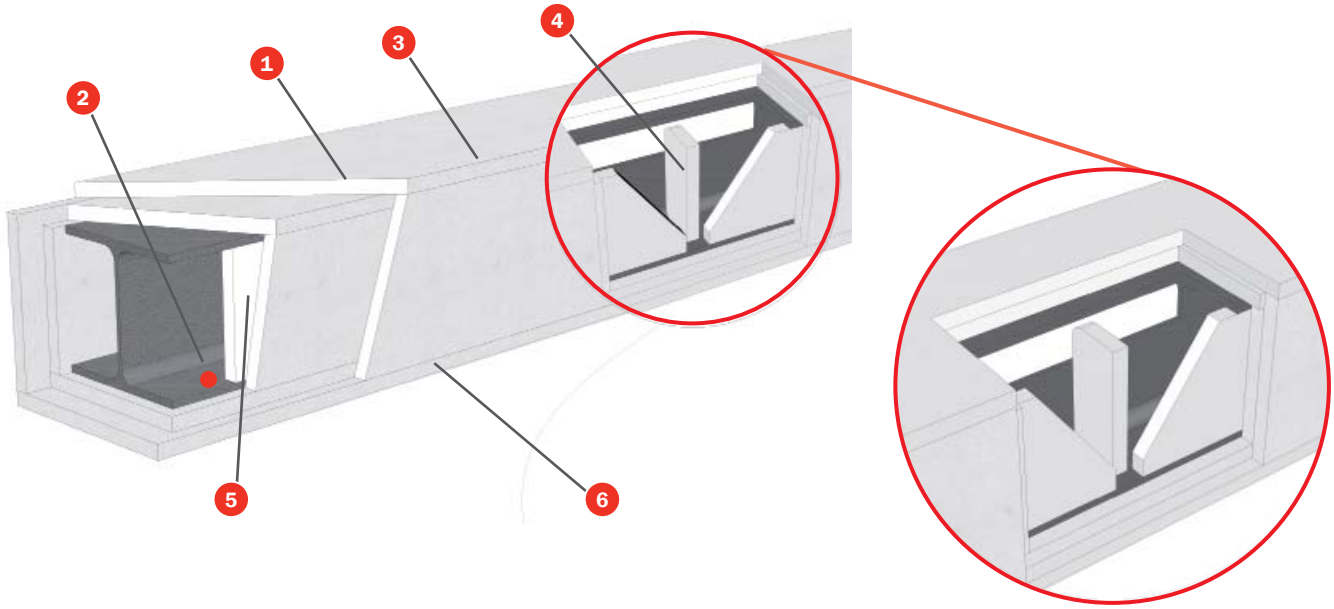
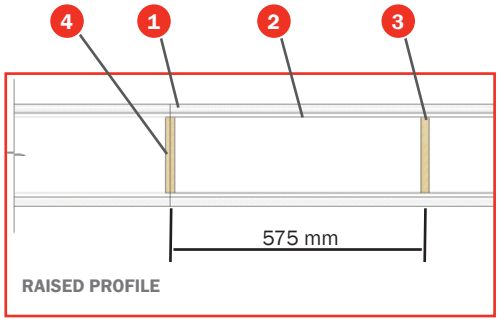
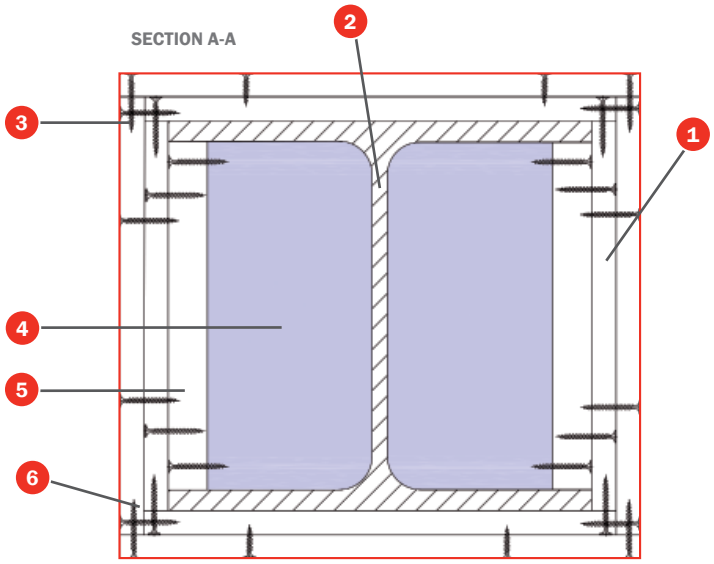
METAL STRUCTURE PROTECTION.

PLATE CLAMPING SYSTEM







TESTS

Standard ENV 13381-4

Laboratory: TECNALIA

Test Nº: 058417-002

SOLUTION

1. **Tecbor®** boards.
2. Profile.
3. Self-tapping screw (size according to board).
4. Taco de placa **Tecbor®** 20 mm.
5. Placa **Tecbor®** 20 mm.
6. **Tecbor®** joint paste..

DESCRIPTION OF ASSEMBLY

Cut stiffeners with **Tecbor®** boards of 20 mm, adapted to the measurements of the metal profi le to be protected. Insert them perpendicular to the axis of the profile at intervals of no more than 575 mm.

Cut **Tecbor®** board strips of the measurement between the fl anges of the metal profile to be protected. Attach these strips to the stiffeners using self-tapping screws, so that the joint between the plates overlaps on a support stiffener.

Attach the **Tecbor®** boards of a thickness equal to or greater than 20 mm to each other and anchored onto the plate stiffeners using self-tapping screws every 250 mm.

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

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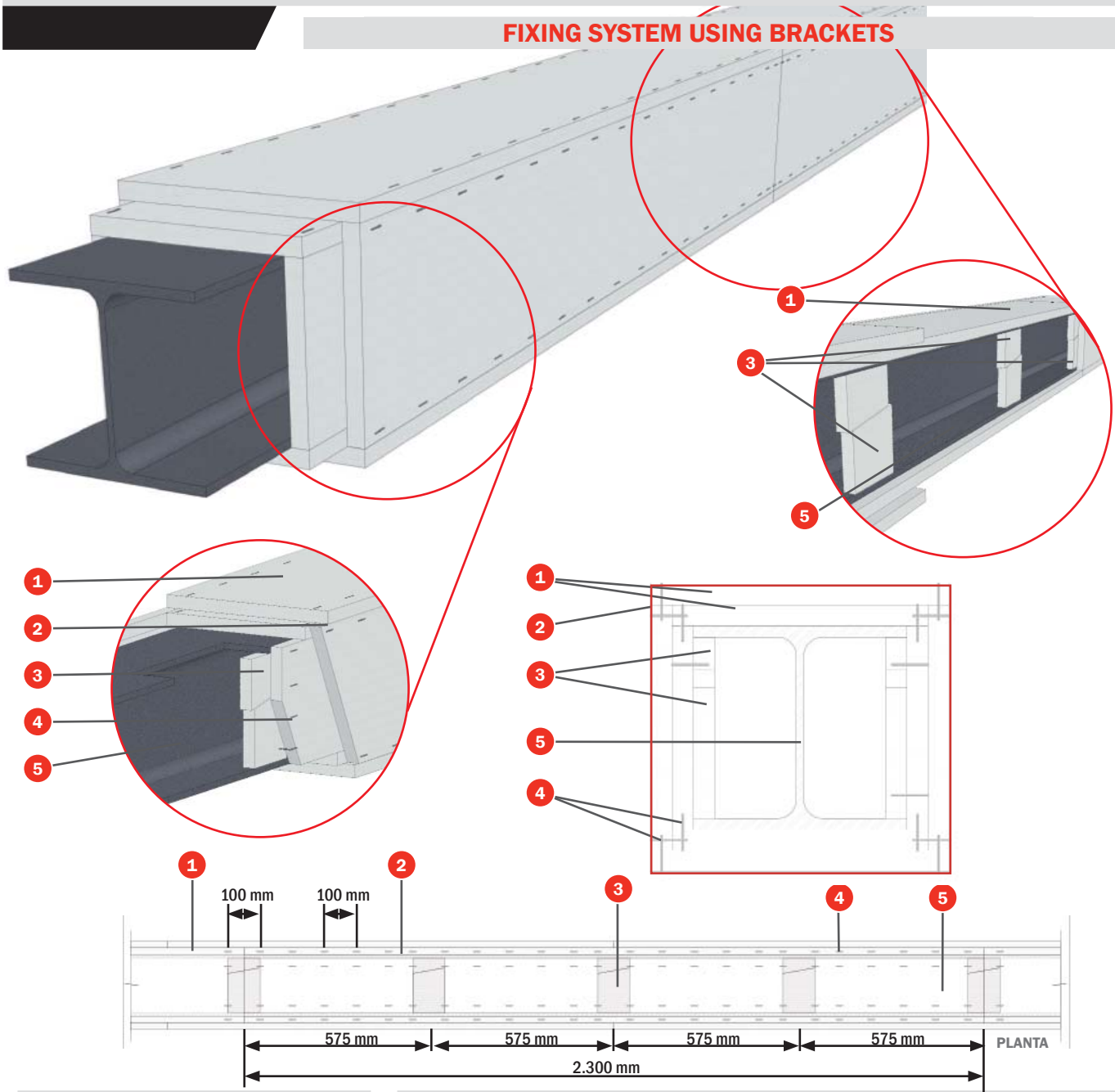
METAL STRUCTURE PROTECTION.

FIXING SYSTEM USING BRACKETS



TESTS

Standard: ENV 13381-4

Laboratory: TECNALIA

Test Nº: 058417-002

SOLUCIÓN

1. **Tecbor®** boards.
2. **Tecbor®** joint paste.
3. Support stiffener for 20 mm **Tecbor®** board.
4. Fixing bracket (dimensions according to board).
5. Steel profile.

DESCRIPTION OF ASSEMBLY

Cut support stiffeners with **Tecbor®** boards of 20 mm, of 100 mm in width and adapted to the measurements of the metal profile to be protected. Insert them using a wedge as indicated in the detailed plans at intervals of no more than 600 mm.

Attach the **Tecbor®** side plates to the support stiffeners so that the joints between the plates overlap on a support stiffener. These **Tecbor®** side plates will be attached using metal brackets separated at intervals of 50 mm between plates.

A support stiffener will only be attached to the **Tecbor®** side plates for the beams, using metal brackets, on the lower face of the profile to be protected and formed with **Tecbor®** boards of 20 mm and 100 mm in width.

Attach the lower **Tecbor®** boards to the side ones and to the lower support stiffeners using metal brackets separated at intervals of no more than 100 mm.

Brackets of a length that is equal to or greater than the total thickness of the plates to be joined will be used; their minimum dimensions will be 35 x 10.6 x 1.6 mm.

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