FIRE RESISTANCE CLASSIFICATION REPORT No. 18539C

Owner of the classification report

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Introduction

This classification report defines the classification assigned to a firestop top and bottom track seal – type: Hilti CFS-TTS – incorporated in a double framed insulated flexible wall constructions, in accordance with the procedures given in EN 13501-2:2016: Fire classification of products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services.

This classification report consists of 9 pages and 3 annexes and may only be used or reproduced in its entirety.

1 Details of classified product

1.1 General

The element, a firestop top and bottom track seal – type: Hilti CFS-TTS – incorporated in flexible wall constructions, is defined as an internal partition for use as non-loadbearing walls.

1.2 Description

The element, a firestop top and bottom track seal incorporated in flexible wall constructions, is fully described below, in support of this classification. The drawings of the test element as it was tested, are enclosed in the annexes 1 till 3 of this classification report.

1.2.1 Composition of the test specimen as tested

The test specimens are a Top and Bottom Track Seal type: Hilti CFS-TTS, installed around the horizontal top and bottom track of a flexible wall. These Track Seals seal the respective track which is freestanding from the vertical studs and boards of the flexible wall construction to absorb movements generated by displacements of a surrounding building construction.

Outer dimensions of the flexible wall:

- height: 2900 mm;
- width: 3000 mm;
- thickness: 210 mm.

At the top, the test frame was provided with a high density concrete slab (thickness: 100 mm, density: 2200kg/m³ (NV)) to simulate the connection of the flexible wall, with an overlying high density concrete floor. The Top Track Seal was placed over the horizontal U-profiles which in turn were fixed to the top slab. The Bottom Track seals were fixed to the bottom of the concrete test frame. The remaining of the wall was constructed up to a 25 mm clearance with the top track seal.

1.2.1.1 Metal frame

Two identical metal frames are installed with an intermediate distance of 50 mm. The frames are coupled to each other, twice per stud.

[1] U-profile – material: galvanized steel – thickness: 0.6 mm – section dimensions: 60 mm x 50 mm x 60 mm – length: 2950 mm.

- position: placed horizontally at the upper and lower horizontal edge connection;
- fixing of the upper profile:
  - by means of metal metal nails [2];
  - to the horizontal high density concrete slab;
  - c/c distance: 300 mm, first fixing point at 50 mm;
- fixing of the lower profile:
  - by means of nail plugs [3];
  - to the lower horizontal edge of the concrete furnace frame;
  - c/c distance: 600 mm, first fixing point at 200 mm.

[2] Metal nails – brand and type: Hilti S-MD 01 PS 4.8x19 – material: stainless steel – diameter: 4.8 mm – length: 19 mm.

[3] Nail plug – material: steel – diameter: 3.8 mm – length: 60 mm – with PVC-plug – diameter: 6 mm – length: 60 mm.

[4] C-profile – material: galvanized steel – thickness: 0.6 mm – outer section dimensions: 6 mm x 49 mm x 48.8 mm x 51 mm x 6 mm – length: 2875 mm.

- position: placed vertically in between the horizontal profiles [1], c/c distance: 600 mm;
- fixing: clamped in between the flanges of the U-profiles;
- fixing C-profile at the fixed vertical edge connection:
  - by means of nail plugs [3];
  - to the vertical edge of the concrete furnace frame;
  - c/c distance: 600 mm, first fixing point at 200 mm;
- clearance at the bottom: 0 mm;
- overlap with top U-profile: 35 mm (see annex 3);
- at the unrestrained vertical edge connection, the C-profile is not fixed to the furnace frame;
- coupling: at a distance of 300 mm and 1500 mm from the top of the flexible wall, the C-profiles (studs) from both metal frames are coupled to each other by

means of horizontally placed C-profiles with a length of 150 mm. The coupling profile is fixed to each stud by means of two drywall screws [7].

[5] Backing strip – material: galvanized steel – thickness: 0.6 mm – width: 60 mm – length: 2950 mm.

- position: placed horizontally to the outer sides of the C-profiles (studs) at the height of the horizontal joint (= 250 mm from the top of the flexible wall).
- fixing:
  - by means of one drywall screw [7] per stud;
  - to the C-profiles (studs).

1.2.1.2 Lining

The metal frame is provided with a double layer of plasterboard per outer side. The vertical joints are located at the vertical mullions and are placed in a staggered manner in comparison with the other side. Horizontal joints are placed in a staggered manner at 250 mm and 350 mm from the top of the flexible wall. At the connection of the lining with the concrete slab at the top, a gap of 25 mm is maintained for the top track seal.

[6] Gypsum board – brand and type: Gyproc Rf 15 mm – classification according to EN 520: DF – thickness: 15 mm – dimensions: 1200 mm x 2875 mm – with longitudinal tapered edges over 50 mm up to a thickness of 12 mm – surface mass: 12.6 kg/m² (MV) – moisture content: 0.53% (MV) at 55°C.

- position: two layers of boards at both outer sides of the double metal frame;

1st layer of boards

- fixing:
  - by means of drywall screws [7];
  - to the vertical profiles [3] of the metal frame;
  - c/c distance: 750 mm;

2nd layer of boards

- fixing:
  - by means of drywall screws [8];
  - to the vertical profiles [3] of the metal frame;
  - c/c distance: 250 mm;
- the boards compress the lowermost 14 mm of the top track seal against the U-profile and the entire bottom track seal against the U-profile, the boards are not screwed to the U-profiles.

[7] Drywall screws – material: phosphated steel – diameter: 3.5 mm – length: 25 mm.

[8] Drywall screws – material: phosphated steel – diameter: 3.5 mm – length: 35 mm.

1.2.1.3 Insulation

[9] Insulation – brand and type: Rockwool RockSolo Solid 211 – material: stone wool – dimension: 1000 mm x 625 mm - thickness: 50 mm – density: 45 kg/m³ (NV).

- position:
  - applied inside the complete flexible wall, in between the two metal stud frames. The insulation boards are placed in a landscape orientation (= width: 1000 mm; height: 625 mm).
- fixing: slightly clamped between the two metal stud frames.

1.2.1.4 Finishing products

[10] Joint tape – material: paper – thickness: 0.2 mm – width: 50 mm.

- position: applied on all the visible vertical and horizontal joints;
- fixing: incorporated in the jointfiller.

[11] Jointfiller.

- position: applied on all joints and screw heads.

1.2.1.5 Linear firestop device

[12] Top and Bottom track seal – U-shape – brand and type: Hilti CFS-TTS – material: based on polyurethane foam, wrapped in a plastic foil – dimensions product: 19 mm x 39 mm at both sides.

- position:
  - placed on the upper and lower horizontal U-profiles [1];
  - along the entire width of the wall;
- fixing: saddles over the U-profiles;
- provided with a joint:
  - at mid-width of the wall;

in the middle in between fixing points of the U-profile.

2 Test reports/EXAP reports and test results in support of the classification

2.1 Test reports/EXAP reports

Name of the laboratory	Report ref. no.	Name of the owner	Date of the test	Method
WFRGENT nv	18539A	Hilti AG	01/08/2017	EN 1364-1:2015

Exposure conditions during the fire resistance test:

Temperature/time curve: standard as in EN 1363-1:2012.

Direction of exposure: The test specimen is a symmetrical construction.

No extra load supplementary to the own weight of the partition wall was applied during the test.

One vertical edge is unrestrained, the other edges are fixed.

2.2 Test results

Parameters	Results
Thermal insulation – I	
ΔT_m = 140°C	124 minutes, no failure(1)
ΔT_M = 180°C	124 minutes, no failure(1)
Integrity – E	
Spontaneous and sustained flaming	124 minutes, no failure(1)
Failure with gap gauge ∅ 6 mm	124 minutes, no failure(1)
Failure with gap gauge ∅ 25 mm	124 minutes, no failure(1)
Ignition of cotton pad	124 minutes, no failure(1)
Radiation – W	
Radiation intensity = 15 kW/m²	124 minutes, no failure(1)

(1) The test was stopped after 124 minutes in consultation with the sponsor.

3 Classification and field of application

3.1 Reference of classification

This classification has been carried out in accordance with clause 7 of EN 13501-2:2016.

3.2 Classification

The element, a firestop top and bottom track seal – type: Hilti CFS-TTS – incorporated in a double framed insulated flexible wall, is classified according to the following combinations of performance parameters and classes as appropriate. No other classifications are permitted.

The classification are valid for both sides of the flexible wall.

EI 120, EI 90, EI 60, EI 45, EI 30, EI 20, EI 15

EW 120, EW 90, EW 60, EW 30, EW 20

E 120, E 90, E 60, E 30, E 20

3.3 Field of direct application

This classification is valid for the following end use applications according to EN 1364-1:2015.

The results of the fire test are directly applicable to similar constructions where one or more of the changes listed below are made and the construction continues to comply with the appropriate design code for its stiffness and stability:

a) unlimited increase and decrease of the width of the wall;
b) unlimited decrease in height of the wall of 2.9 m;
c) increase in height of the wall to 4 m, if the expansion allowances are increased pro-rata;
d) increase in the thickness of the wall (≥210 mm);
e) increase in the thickness of component materials:
   - metal frame width (≥50 mm);
   - board thickness (≥15 mm);
   - insulation thickness (≥50 mm);
f) decrease in linear dimensions of the boards, but not the thickness:
   - width (≤1200 mm);
   - height (≤2650 mm);
g) decrease in stud spacing (≤600 mm);
h) decrease in distance of fixing centres:
   - of the metal stud frame to the edges of the surrounding building structure (≤600 mm);
   - of the screws fixing the boards to the vertical metal studs (≤250 mm);
i) increase in the number of horizontal joints of both layers of boards;
j) increase in the number of vertical joints of both layers of boards;
k) only horizontal and vertical joints (of the type tested) are permitted.

4 Limitations

This classification report does not represent type approval nor certification of the product.

According to the information mentioned by the sponsor on the technical information sheet there was no product standard for CE marking available at the time the classification report for the tested material/product was drafted.

When such a product standard is published, this report may be submitted again to the laboratory to evaluate the adequacy of the report for CE marking.

Provisions of Regulation (EU) 305/2011, commonly known as the Construction Products Regulation (CPR), prevail over any conflicting provisions in the harmonised standards and technical specifications.

SIGNED

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APPROVED

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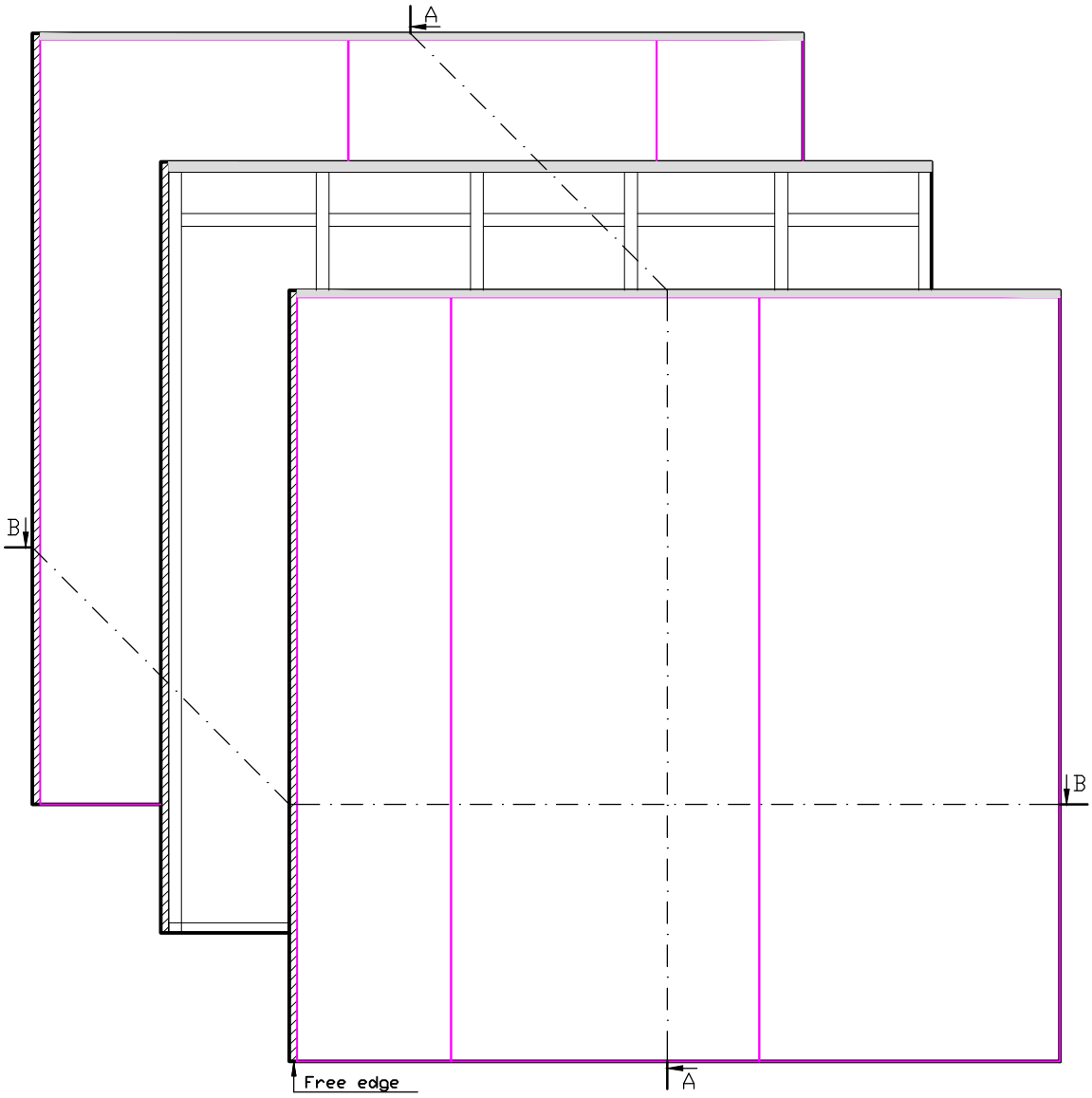
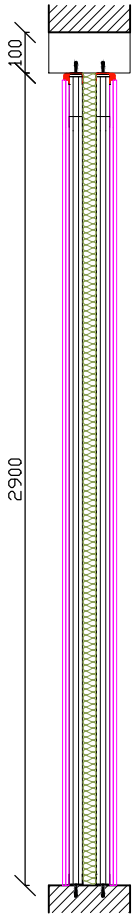
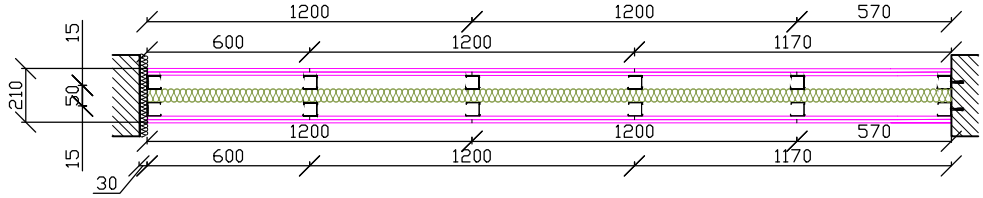
This document is the original version of the classification report and is written in English.

Lay-out of the boards and the seal - dimensions - sections A-A and B-B.



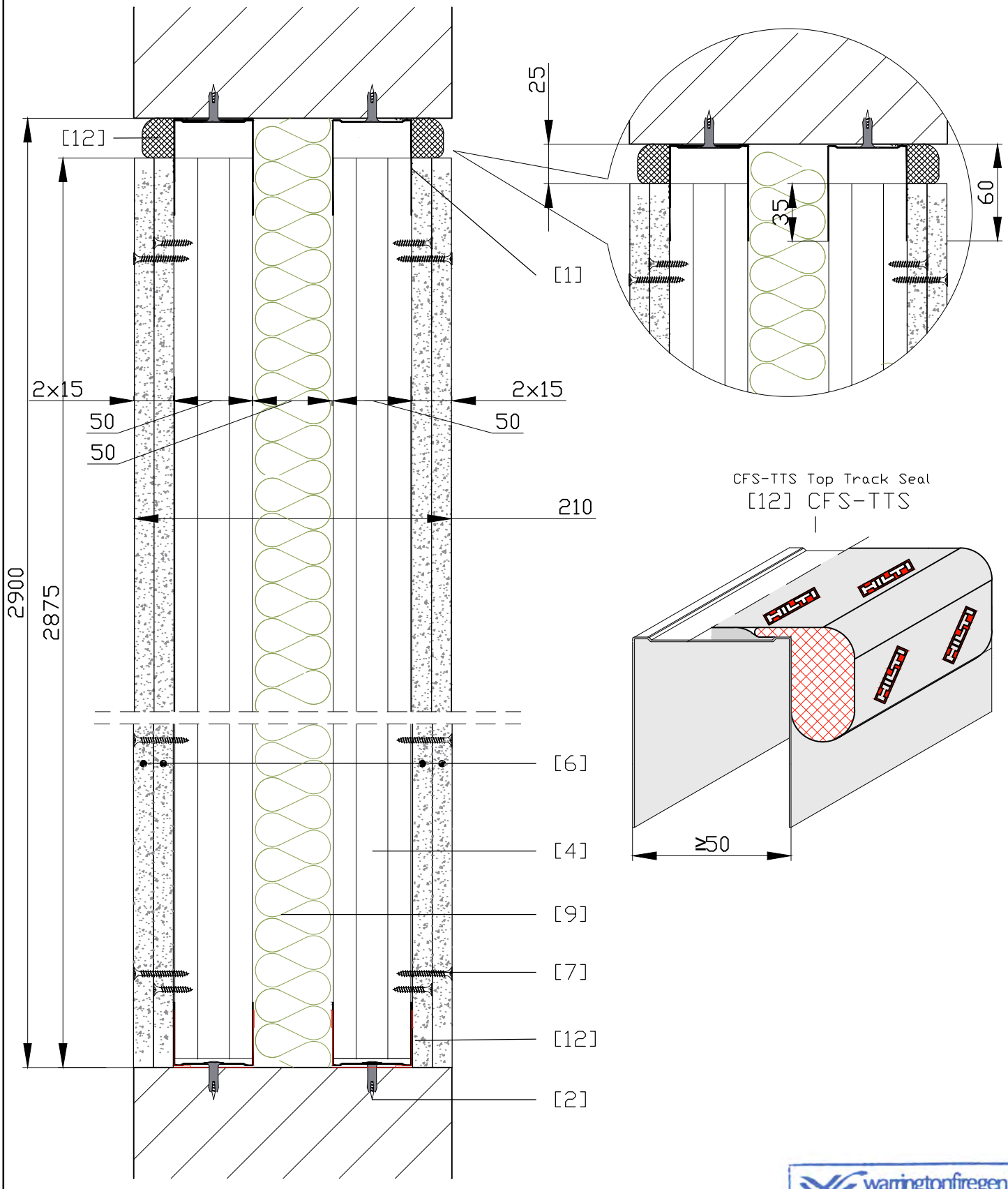


Section A-A

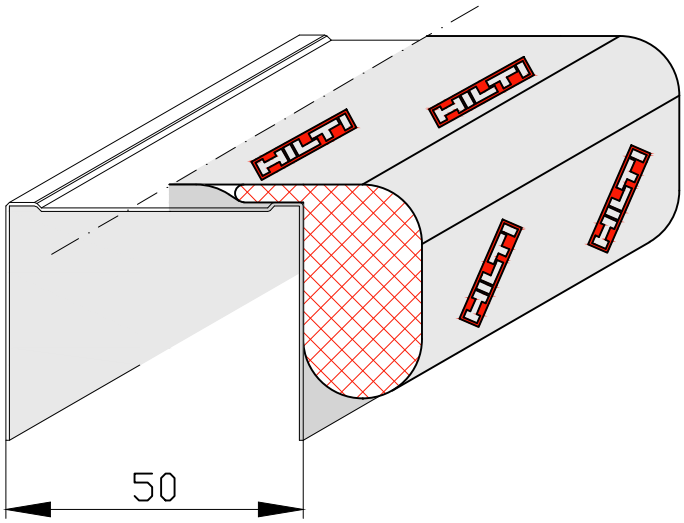


Section B-B

Vertical section A-A - details.



- Tested CFS-TTS Top Track Seal



- Following CFS-TTS variations are covered

CFS-TTS Top Track Seal with increased width