FIRE RESISTANCE CLASSIFICATION REPORT No. 18538C

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 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 10 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.

The flexible wall is constructed as prescribed in the European standard EN 1363-1:2012 § *7.2.2 Standard supporting constructions.* The flexible wall concerns a flexible standard wall construction with an intended fire resistance of 90 minutes.

Outer dimensions of the flexible wall:

- height: 2900 mm;
- width: 3000 mm;
- thickness: 120 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 a horizontal U-profile which in turn was fixed to the top slab. The Bottom Track seal was 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

The metal frame is composed of horizontal U-profiles at the upper and lower horizontal edge connection. In between these, the vertical C-profiles are installed. The both firestop top and bottom track seals are placed over the upper and lower U-profile.

[1] U-profile – material: galvanized steel – thickness: 0.6 mm – section dimensions: 40 mm x 70 mm x 40 mm – length: 2950 mm.

- position: placed horizontally at the upper and lower horizontal edge connections;
- fixing of the upper profile:
  - by means of 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 metal nails [2;]
  - to the lower horizontal edge of the concrete furnace frame;
  - c/c distance: 600 mm, first fixing point at 200 mm.

[2] Nail – brand and type: Hilti X-S B3 MX – material: stainless steel – diameter: 4.8 mm – length: 14 mm.

[3] C-profile – material: galvanized steel – thickness: 0.6 mm – outer section dimensions: 8 mm x 48 mm x 69 mm x 48 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;
- clearance at the bottom: 0 mm;
- overlap with top U-profile: 15 mm (see annex 2);
- at the unrestrained vertical edge connection, the C-profile is not fixed to the furnace frame.

1.2.1.2 Lining

The metal frame is provided with a double layer of gypsum boards per side. The vertical joints are located at the vertical mullions and are placed in a staggered manner one layer in comparison to another. At the connection of the lining with the supporting construction, a gap of 25 mm is maintained for the top track seal.

[4] Gypsum board – brand and type: Gyproc Rf 12.5 mm – classification according to EN 520: DF – thickness: 12.5 mm – dimensions: 1200 mm x 2875 mm – with longitudinal tapered edges over 50 mm up to a thickness of 10 mm – surface mass: 10.45 kg/m² (MV) – moisture content: 0.48% (MV) at 55°C.

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

  1st layer of boards

- fixing:
  - by means of drywall screws [5];
  - to the vertical profiles [3] of the metal frame;
  - c/c distance: 750 mm;

  2nd layer of boards

- fixing:
  - by means of drywall screws [6];
  - 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.

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

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

1.2.1.3 Insulation

[7] Insulation – brand and type: Rockwool Rockfloor Solid – material: stone wool – dimensions: 625 mm x 1000 mm – thickness: 50 mm – density: 100 kg/m³ (NV).

- position:
  - vertically applied in the flexible wall;
  - at the top and bottom of the flexible wall (below the mineral wool insulation for the top track seal), the insulation is left out over a height of 100 mm;
- fixing: slightly clamped between the flanges of the metal frame.

1.2.1.4 Finishing products

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

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

[9] Jointfiller.

- position: applied on all joints and screw heads.

1.2.1.5 Linear firestop device

[10] 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-profile [1];
  - along the entire width of the wall;
- fixing: saddles over the U-profile;
- provided with:
  - a joint at mid-width of the wall;
  - in the middle in between fixing points of the U-profile.

[11] Insulation – brand and type: Rockwool Rocksolo Solid 211 – material: stone wool – thickness: 50 mm – density: 45 kg/m³ (NV).

- number: 2 layers;
- position: at the top of the flexible wall, inside the top track over a height of 200 mm an the entire length of the wall;
- fixing: clamped between the C-profiles [3] and supported by 45° angled c-profiles (length: 150 mm) secured on the both sides of the wall studs.

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	18538A	Hilti AG	31/07/2017	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.

The intention of this test is to demonstrate the fire resistance performance of the Hilti CFS-TTS Track Seal with the purpose to install this Top and Bottom Track Seal in all flexible wall constructions which have demonstrated an EI 90, EW 90 or E 90 classification. For that reason the standard flexible supporting construction with an intended fire resistance of EI 90 from European Standard EN 1363-1:2012 is applied for this test. With the only deviation that the internal insulation from the flexible wall was removed over a distance of 100 mm from the top track seal. In this way the worst case situation was tested: an insulated wall with insulated vertical studs which generates the maximum bending of the flexible wall and the removal of the 100 mm internal insulation to eliminate the positive insulation effect on the top track seal.

2.2 Test results

Parameters	Results
Thermal insulation – I	
ΔT_m = 140°C	120 minutes, no failure(1)
ΔT_M = 180°C	101 minutes
Integrity – E	
Spontaneous and sustained flaming	120 minutes, no failure(1)
Failure with gap gauge ∅ 6 mm	120 minutes, no failure(1)
Failure with gap gauge ∅ 25 mm	120 minutes, no failure(1)
Ignition of cotton pad	120 minutes, no failure(1)
Radiation – W	
Radiation intensity = 15 kW/m²	120 minutes, no failure(1)

(1) The test was stopped after 120 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 flexible wall constructions, 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 90, EI 60, EI 45, EI 30, EI 20, EI 15

EW 90, EW 60, EW 30, EW 20

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:

- the test results may be applied to all flexible wall constructions provided:
  - the construction is classified in accordance with EN 13501-2;
  - the construction has an overall thickness equal to or greater than 120 mm;
  - at least two layers of boards are applied at both sides of the metal stud frame;
  - the flexible wall construction may or may not be insulated;
- the test results do not cover sandwich panel constructions and flexible walls where the lining does not cover the studs on both sides;
- the horizontal top and bottom track of the flexible wall construction may be fixed to high density concrete overlying building constructions.
- the tested top and bottom track seal shape cover top and bottom track seals with bigger section dimensions (see annex 3).

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.

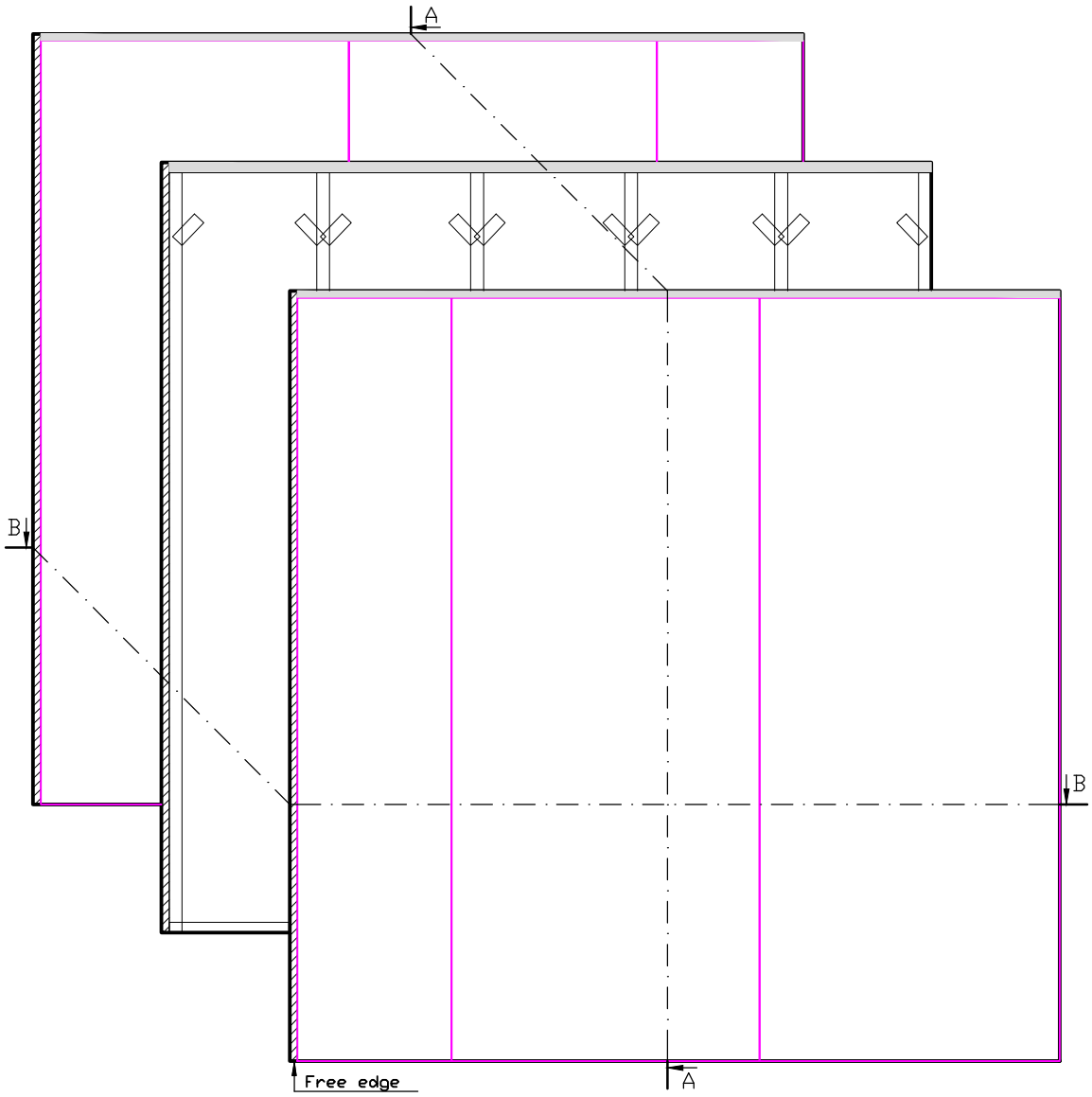
Provisions of Regulation (EU) 305/2011, commonly known as the Construction Products Regulation (CPR), prevail over any conflicting provisions in the harmonised standards and technical specifications.

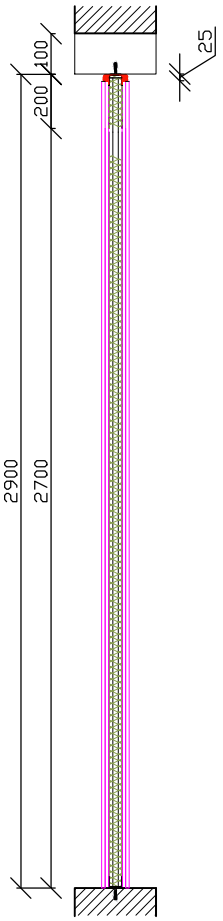
SIGNED	APPROVED
Stephanie Van Bockhaven (Signature) Project assistant Ghent 2017.08.30 13:40:05 +02'00'	Peter Tack (Signature) Project leader Ghent 2017.08.30 13:58:11 +02'00'
Signature 1	Signature 2

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

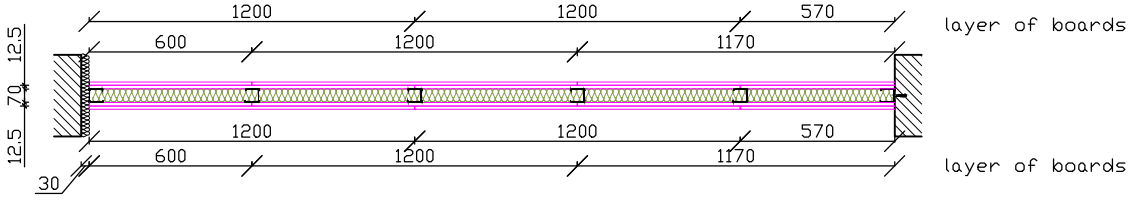
The authenticity of the electronic signatures is assured by Belgium Root CA.

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



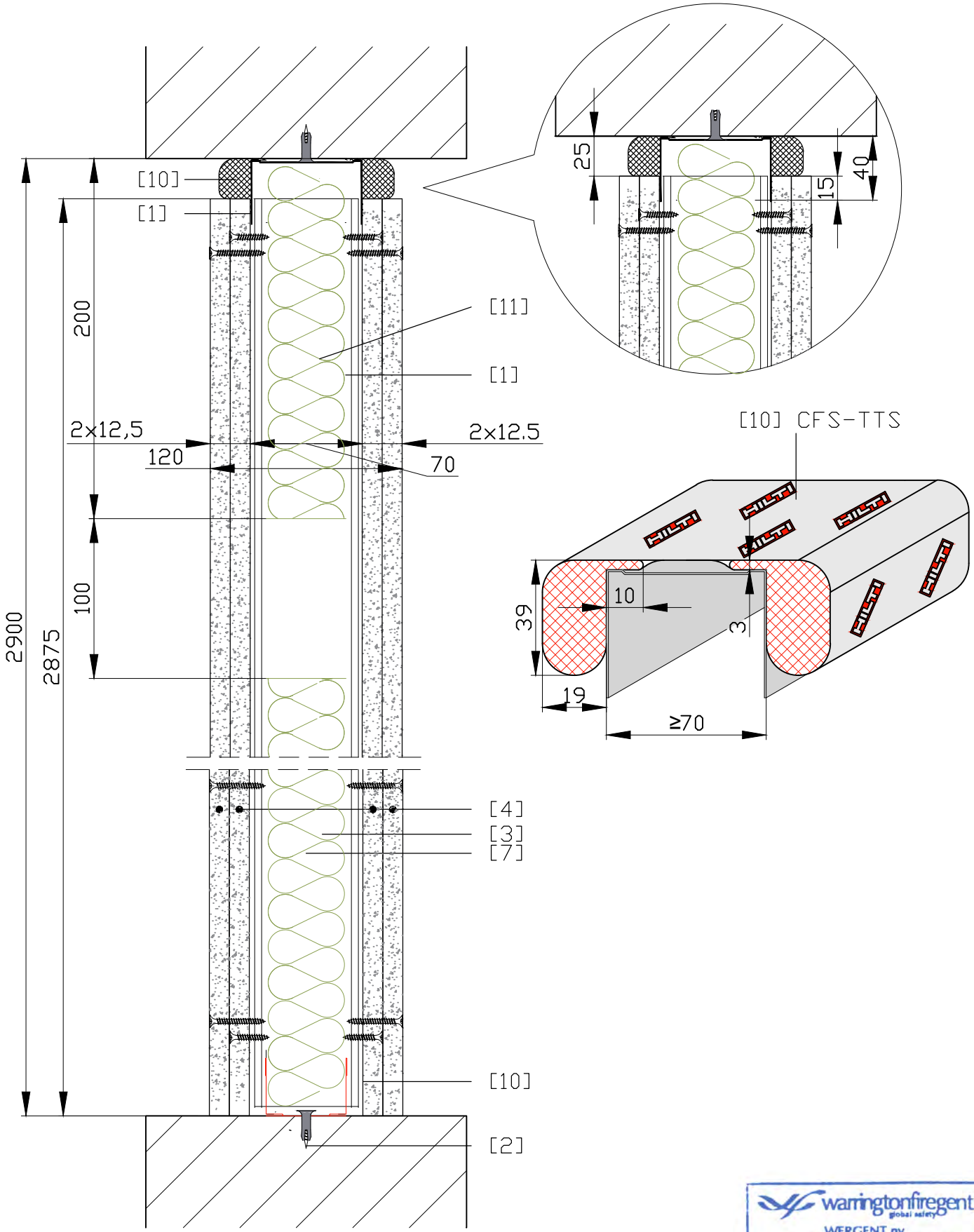


Section A-A

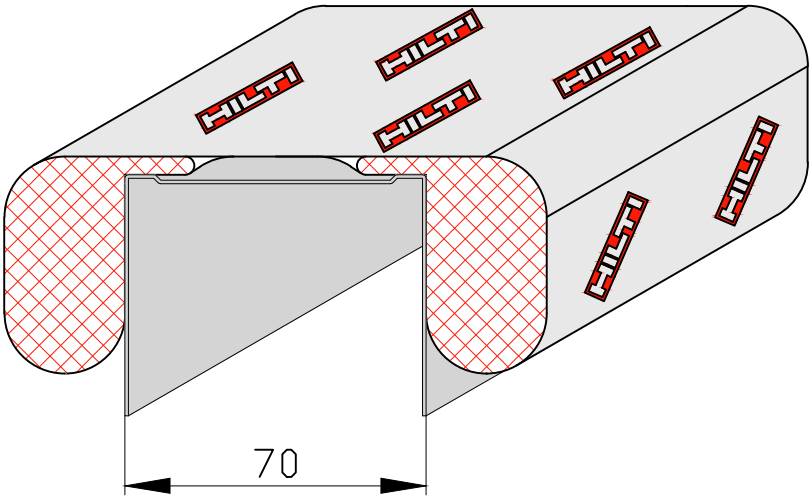


Section B-B

Vertical section A-A - details.

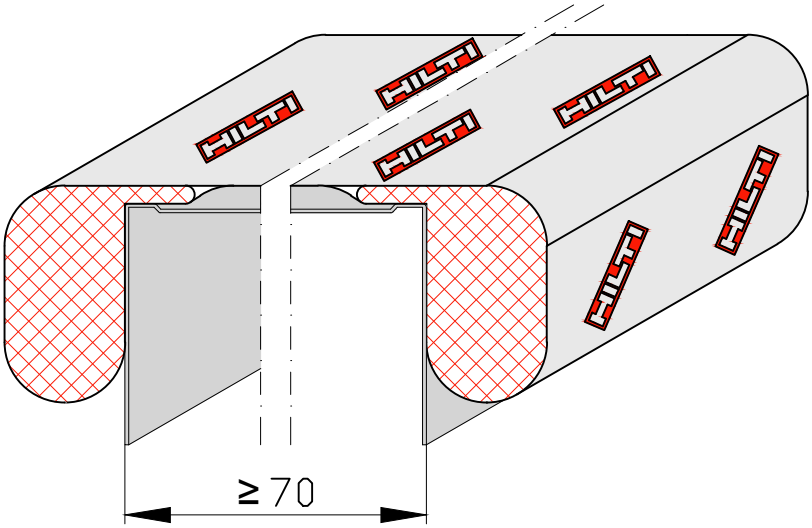


- Tested CFS-TTS Top Track Seal



- Following CFS-TTS variations are covered

CFS-TTS Top Track Seal with increased width



CFS-TTS Top Track Seal with a larger amount of reactive product