

TRI MO TRIMOTERM



Trimoterm Fire
Guidelines

For design and installation teams!

Trimoterm Fire Guidelines

Descriptions of details and other information in this document are only provided to illustrate the system(s) of Trimoterm cladding products and applications. Each user of such information is fully responsible for the incorporation of this advisory information in their design.

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A

Fire safety

Fire safety in buildings is achieved by passive fire protection systems, such as fire-resistant external and internal walls, ceilings, and roofs, as well as other building elements to contain fire, heat, and smoke, with the aim of protection and limiting the spread of fire to a single compartment within the building.

The decision to use sandwich panels in a building is based on the global fire safety design objectives. These objectives affect life safety, loss prevention and environmental protection.

Fire performance of sandwich panels is evaluated by the following criteria:

Fire Resistance: The ability of the panels to maintain their space-enclosing or load-bearing function and thermal insulation properties during a fire.

Reaction to Fire: How the material reacts when exposed to fire, including ignitability, flame spread, and smoke production

All requests for fire safety must be clearly specified in the project design.

A.1 Fire resistance

Fire resistance is the ability of the panel to resist fire for a specified period of time. The standard fire resistance rating values are 15, 30, 45, 60, 90, 120, 180 and 240 minutes. This rating typically means the period during which a passive fire protection system can withstand a standard fire resistance load (EN 13501-2).

Fire resistance criteria classes

R (Load-bearing capacity): Ability to maintain load-bearing without the loss of structural stability.

E (Integrity): Ability of the product to prevent the passage of fire and hot gases into an area not affected by the fire.

I (Insulation): Ability to limit heat transmission through the element.

W (Radiation): This indicates the structure's ability to limit the passage of radiant heat. It measures how well the structure can prevent the transfer of heat through radiation to the unexposed side.

M (Mechanical Impact): This refers to the structure's ability to withstand mechanical impacts during a fire. It ensures that the structure can maintain its integrity even when subjected to physical impacts

The symbols are used in the following way for load-bearing panels: REI, EI, EI-W, EI-m.

For fire ratings see chapter **C Fire resistance span tables.**

FACT

Test with FTV 240 mm, L=6,0m achieved EI result of 315 minutes!

Trimo actively invests in fire testing at institutes across Europe, North America and Asia to ensure the highest standards of safety and reliability. Each year, Trimo conducts around 10 fire tests and collaborates with international research facilities to evaluate and enhance the fire resistance of its materials.

A

A.2 Reaction to fire

Reaction to Fire is an essential characteristic of building/construction products.

Reaction to Fire classification (EN 13501-1) assesses how much a material/product contributes to the development of a fire in its early stages.

The key criteria include:

Ignitability: How easily the material catches fire.

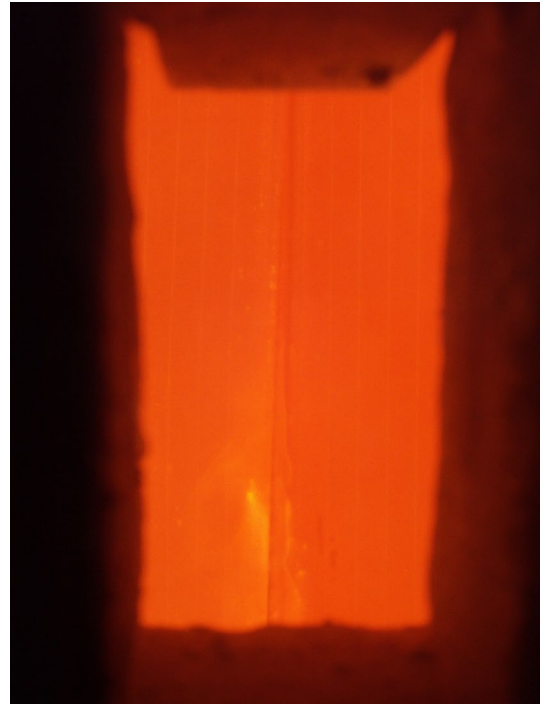
Flame Spread: The speed at which flames spread across the surface of the material.

Heat Release: The amount of energy released as the material burns.

Smoke Production: The density and volume of smoke produced.

Flaming Droplets: The potential for burning droplets to fall from the material.

These classifications help ensure that the materials/products used in construction provide adequate fire safety by limiting fire spread, smoke production and flaming debris.



FACT

Stone mineral wool is a non-combustible material with a melting point above 1000°C.

Steel sheet is a non-combustible material with a melting point above 1300°C.

A

1. Combustibility to fire class

Materials classified A1 and A2 are non-combustible, class B are non-flammable, and class F are not tested for fire is in the specific case of sandwich panels.

Combustibility Classes

- A1: Non-combustible, no contribution to fire.
- A2: Limited combustibility.
- B: Very limited contribution to fire.
- C: Limited contribution to fire.
- D: Acceptable contribution to fire.
- E: Acceptable performance in case of a small fire.
- F: No performance determined.

2. Smoke propagation level

This parameter deals with the emission of fumes.

Smoke Production Classes

- s1: Little or no smoke production.
- s2: Limited smoke production.
- s3: High smoke production.

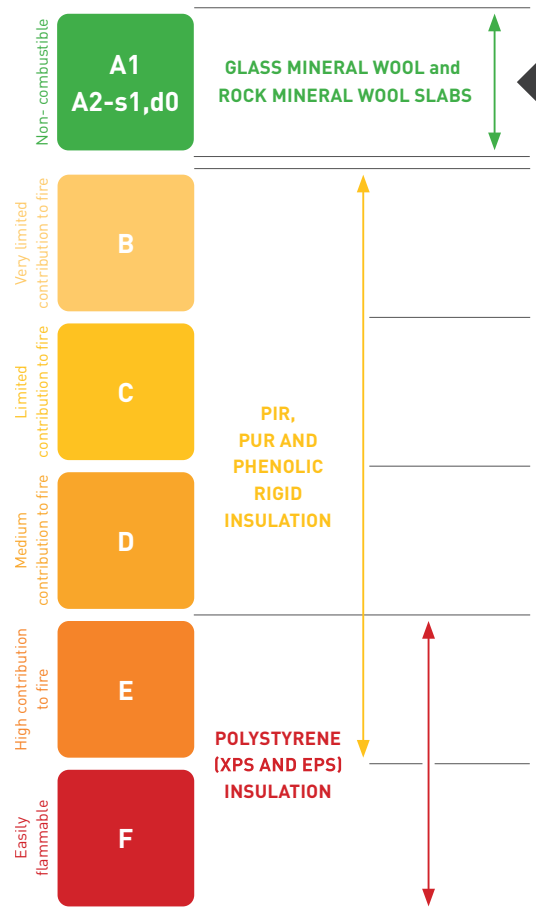
3. Presence of flaming droplets

This parameter deals with the presence of dripping or incandescent particles that develop during combustion and that can spread the fire.

Flaming Droplets/Particles Classes

- d0: No flaming droplets or particles.
- d1: Limited flaming droplets or particles.
- d2: High flaming droplets or particles.

Trimoterm sandwich panels are composed of **A1** steel and **A1** mineral wool. The panels themselves are rated **A2-s1,d0** with no significant contribution to fire growth.



Reaction to fire classification system (Euroclasses)



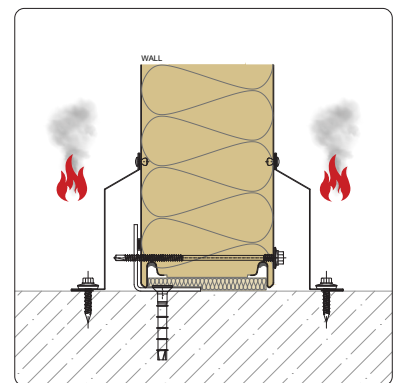
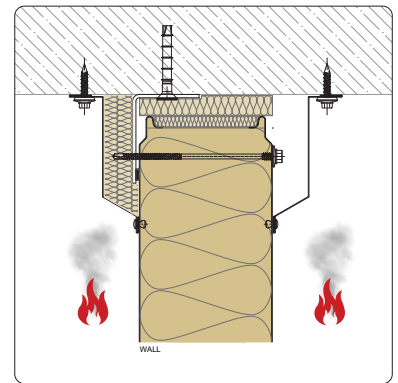
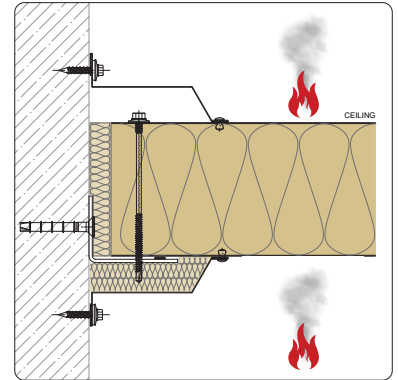
B

Trimoterm panel application

www.trimo-group.com

B.1 Fire-resistant panel installation details

All gaps shall be insulated with stone wool insulation RF class A1 (EN13501-1), non-combustible material with a melting point over 1000 °C.



Trimoterm FTV Fire-resistant internal wall system details

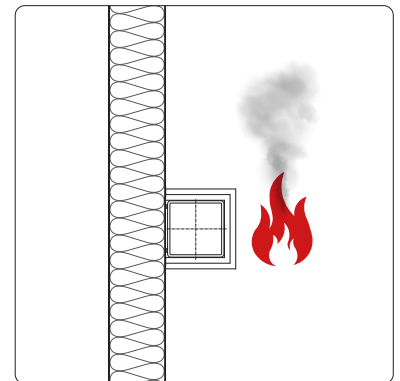


B

B.2 Fire protection of load-bearing structure

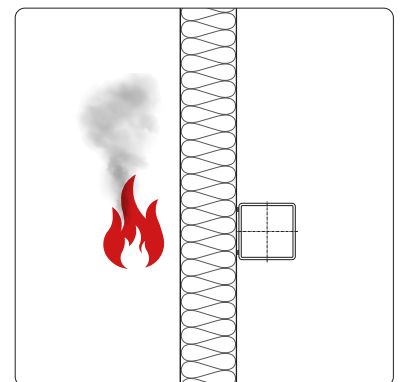
Load-bearing structure on the fire load side

All load-bearing structure must have a fire resistance equal to or greater than that of the Trimoterm panels.
Fixing of Trimoterm panels (screws) does not require any additional fire protection.



Load-bearing structure on the fire protected (cold) side

The load-bearing structure is protected with Trimoterm panels.
Therefore, no fire resistance is required for the structure.
Fixings for Trimoterm panels (screws) do not require any additional fire protection.



SUPPORTING INFORMATION!

The support structure must have at least the same load-bearing capacity (R) of the fire resistance performance as the sandwich panel ceiling regarding insulation and integrity (EI).

(source: Standard EN 13501-2)



OFFICE BUILDING BORGER GREMO
LJUBLJANA, SLOVENIA, 2018

P PLUS arhitekti d.o.o., Primož Boršič M.Arch.

C

Fire resistance span tables

The fire resistance span tables for Trimoterm products are provided in accordance with the fire resistance tests performed and the rules laid down in EN 15254-5:2018 and EN 15254-7:2018.

In the tables, you will find information on the maximum allowable length (in metres) to achieve the specified fire rating under various conditions, including panel thickness, core type, installation orientation, and the direction of fire.

EXTERNAL FACADE, INTERNAL WALL 12

Trimoterm FTV

Trimoterm FTV HL

ROOF, EXTERNAL SOFFIT 17

Trimoterm SNV

SOUND PANEL 18

Trimoterm FTV

BACKING WALL 19

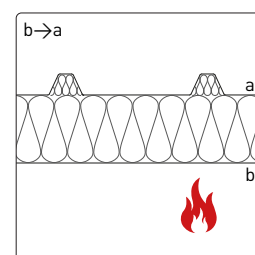
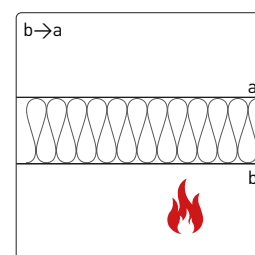
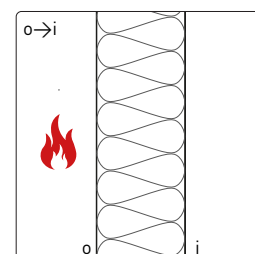
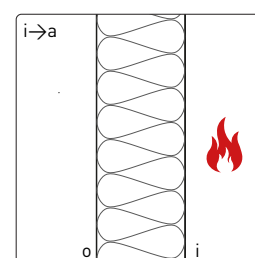
Trimoterm FTV

CEILING 20

Trimoterm FTV - Self supporting ceiling

Trimoterm FTV HL - Self supporting ceiling

Trimoterm FTV - Suspended ceiling



i→o inside to outside
o→i outside to inside
b→a below to above



C

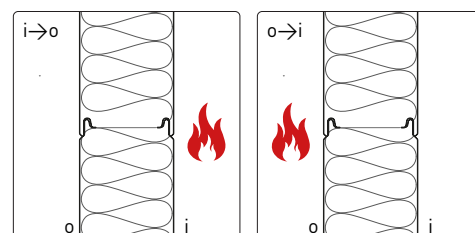
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C.1 External façade, internal wall

C.1.1 Trimoterm FTV

VERTICAL / HORIZONTAL INSTALLATION

Distances determined on the basis of fire resistance tests and standard EN 15254-5:2018



Power T

i→o; o→i

	EI 15		EI 20		EI 30		EI 45		EI 60		EI 90		EI 120		EI 180		EI 240	
Thickness [mm]	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	4	6	-	-	-	-	-	-
120	8.8	7.5	8.8	7.5	8.8	7.5	8.8	7.5	8.8	7.5	7.5	7.5	7.5	4	-	-	-	-
133	8.8	7.5	8.8	7.5	8.8	7.5	8.8	7.5	8.8	7.5	7.5	7.5	7.5	4	-	-	-	-
150	10	10	10	10	10	10	10	10	9	10	8.98	8	7.5	7.5	4	4	-	-
172	10	10	10	10	10	10	10	10	9	10	8.98	8	7.5	7.5	4	4	-	-
200	10	10	10	10	10	10	10	10	10	10	9	8	7.5	7.5	4	6	-	4
220*	10	10	10	10	10	10	10	10	10	10	9	8	7.5	7.5	4	6	-	4
240	10	10	10	10	10	10	10	10	10	10	9	8	7.5	7.5	4	6	-	4
250**	10	10	10	10	10	10	10	10	10	10	9	8	7.5	7.5	4	6	-	4

Perform C / Power S

i→o; o→i

	EI 15		EI 20		EI 30		EI 45		EI 60		EI 90		EI 120		EI 180		EI 240	
Thickness [mm]	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	7.5	7.5	7.5	7.5	4	4.5	-	-	-	-	-	-	-	-	-	-	-	-
80	7.5	7.5	7.5	7.5	4	7.5	4	7.5	4	7.5	-	-	-	-	-	-	-	-
100	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	4	7.5	-	-	-	-
120	8.8	10	8.8	10	8.8	10	8.8	10	8.8	10	7.5	8	7.5	7.5	-	-	-	-
133	8.8	10	8.8	10	8.8	10	8.8	10	8.8	10	7.5	8	7.5	7.5	-	-	-	-
150	10	10	10	10	10	10	10	10	9	10	8.98	8	7.5	7.5	4	6	-	-
172	10	10	10	10	10	10	10	10	9	10	8.98	8	7.5	7.5	4	6	-	-
200	10	10	10	10	10	10	10	10	10	10	9	8	7.5	7.5	4	7.5	-	4
220	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a
240	10	10	10	10	10	10	10	10	10	10	9	8	7.5	7.5	4	7.5	-	6
250	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a

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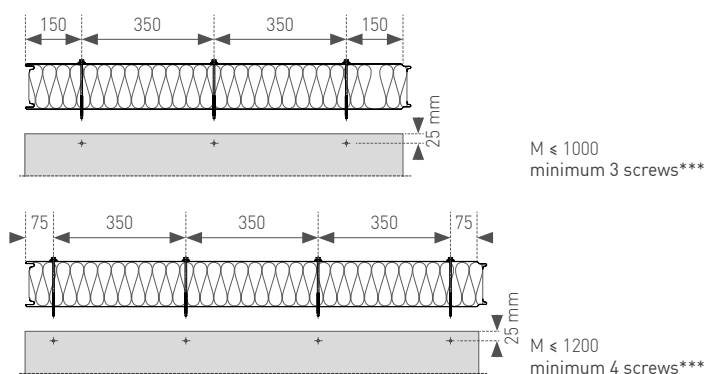
C

Perform R

i→o; o→i

	EI 15		EI 20		EI 30		EI 45		EI 60		EI 90		EI 120		EI 180		EI 240	
Thickness [mm]	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	-	7.5	-	7.5	-	7.5	-	4	-	-	-	-	-	-	-	-	-	-
100	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	4	7.5	-	-	-	-
120	8.8	7.5	8.8	7.5	8.8	7.5	8.8	7.5	8.8	7.5	7.5	7.5	7.5	7.5	-	-	-	-
133	8.8	7.5	8.8	7.5	8.8	7.5	8.8	7.5	8.8	7.5	7.5	7.5	7.5	7.5	-	-	-	-
150	10	10	10	10	10	10	10	10	9	10	8.98	8	7.5	7.5	4	4	-	-
172	10	10	10	10	10	10	10	10	9	10	8.98	8	7.5	7.5	4	4	-	-
200	10	10	10	10	10	10	10	10	10	10	9	8	7.5	7.5	4	6	-	4
220	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a
240	10	10	10	10	10	10	10	10	10	10	9	8	7.5	7.5	4	6	-	4
250	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a

Fire-resistant panel fastening



n/a Product not available

* Check for availability

** For French or German market consult Trimo's technical support to comply with regional legislation

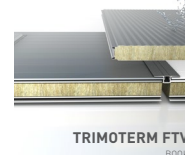
*** The minimum fixing quantity required for fire-resistant facade overrides potential lower values determined by statical calculations.

- Data not available



Trimoterm FTV Book

TRI
MO
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TRIMOTERM FTV
BOOK



C

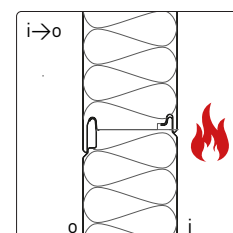
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C.1 External façade, internal wall

C.1.2a Trimoterm FTV HL

VERTICAL / HORIZONTAL INSTALLATION

Distances determined on the basis of fire resistance tests and standard EN 15254-5:2018



Power T

i→o

	EI 15		EI 20		EI 30		EI 45		EI 60		EI 90		EI 120		EI 180		EI 240	
Thickness [mm]	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	7.5	-	7.5	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
100	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	4	7.5	-	-	-	-	-	-	-	-
120	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	-	-	-
133	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	-	-	-
150	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	-
172	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4
200	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4
220*	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4
240	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4
250**	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4

Perform C / Power S

i→o

	EI 15		EI 20		EI 30		EI 45		EI 60		EI 90		EI 120		EI 180		EI 240	
Thickness [mm]	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	7.5	7.5	7.5	-	4	-	-	-	-	-	-	-	-	-	-	-	-
80	7.5	7.5	7.5	7.5	4	6	-	6	-	6	-	-	-	-	-	-	-	-
100	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	4	7.5	-	7.5	-	6	-	-	-	-
120	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	-	-	-
133	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	-	-	-
150	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	-
172	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4
200	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4
220	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a
240	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4
250	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a

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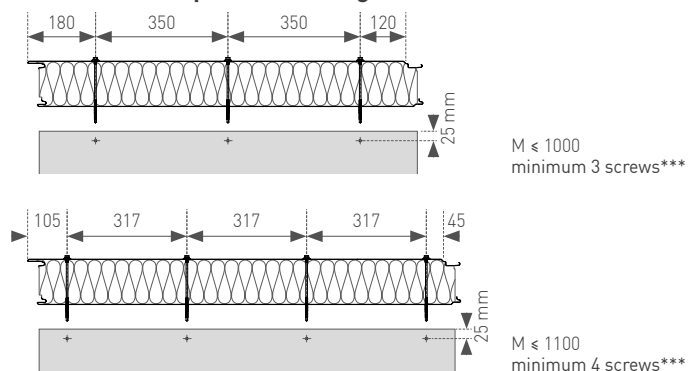
C

Perform R

i→o

	EI 15		EI 20		EI 30		EI 45		EI 60		EI 90		EI 120		EI 180		EI 240	
Thickness [mm]	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	4	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	7.5	6	7.5	6	4	6	-	6	-	6	-	-	-	-	-	-	-	-
100	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	4	7.5	-	7.5	-	4	-	-	-	-
120	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	-	-	-
133	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	-	-	-
150	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	-
172	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4
200	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4
220	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a
240	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	4
250	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a

Fire-resistant panel fastening



* Check for availability

** For French or German market consult Trimo's technical support to comply with regional legislation

*** The minimum fixing quantity required for fire-resistant facade overrides potential lower values determined by static calculations.

n/a Product not available

- Data not available

All information issued by Trimo Group is subject to continuous development and information/details contained on this media are current at the date of issue. It is the user's responsibility to obtain the most up-to-date information from Trimo when information/details are used for a project. The latest version of the document is available on: <https://www.trimo-group.com/en/downloads/technical-documents>

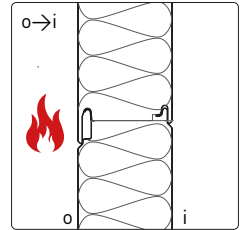
C

C.1 External façade, internal wall

C.1.2b Trimoterm FTV HL

VERTICAL / HORIZONTAL INSTALLATION

Distances determined on the basis of fire resistance tests and standard EN 15254-5:2018

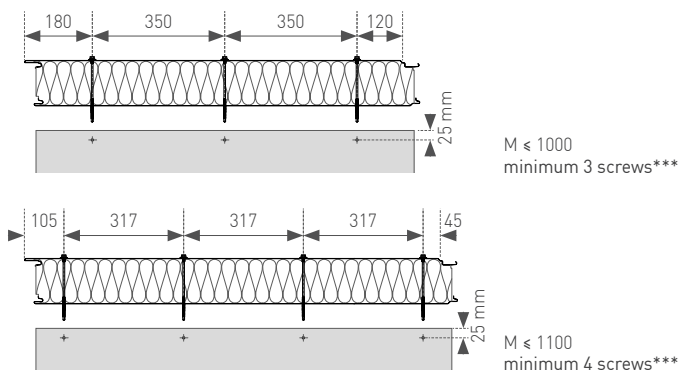


Power T / Perform R / Perform C / Power S

o→i

	EI 15		EI 20		EI 30		EI 45		EI 60		EI 90		EI 120		EI 180	
Thickness [mm]	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	7.5	-	7.5	-	7.5	-	7.5	-	7.5	-	-	-	-	-	-	-
120	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	-
133	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	6	-	-
150	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	4	-
172	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	4	-
200	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	4	-
220*	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	4	-
240	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	4	-
250**	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6	4	-

Fire-resistant panel fastening



* Power T only / Check for availability

** Power T only / For French or German market consult Trimo's technical support to comply with regional legislation

*** The minimum fixing quantity required for fire-resistant facade overrides potential lower values determined by statical calculations.

- Data not available

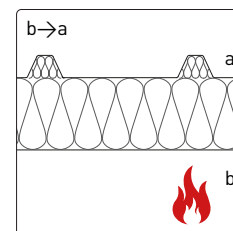


C

C.2 Roof, external soffit

Trimoterm SNV

Distances determined on the basis of fire resistance tests and standard EN 15254-5:2018.
Contact technical support for applicable loads.



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Power T

b→a

Thickness [mm]	REI 15	REI 30	REI 45	REI 60	REI 90	REI 120
60	-	-	-	-	-	-
80	-	-	-	-	-	-
100	4.4	4.4	4.4	4.4	4.4	4.4
120	4.4	4.4	4.4	4.4	4.4	4.4
133	n/a	n/a	n/a	n/a	n/a	n/a
150	4.4	4.4	4.4	4.4	4.4	4.4
172	4.4	4.4	4.4	4.4	4.4	4.4
200	4.4	4.4	4.4	4.4	4.4	4.4
220*	4.4	4.4	4.4	4.4	4.4	4.4
240*	4.4	4.4	4.4	4.4	4.4	4.4

Perform C

b→a

Thickness [mm]	REI 15	REI 30	REI 45	REI 60	REI 90	REI 120	REI 180
60	3.29	3.29	-	-	-	-	-
80	3.29	3.29	2.15	2.15	-	-	-
100	4.4	4.4	4.4	4.4	4.4	4.4	-
120	4.4	4.4	4.4	4.4	4.4	4.4	-
133	n/a	n/a	n/a	n/a	n/a	n/a	n/a
150	4.4	4.4	4.4	4.4	4.4	4.4	3.29
172	4.4	4.4	4.4	4.4	4.4	4.4	3.29
200	4.4	4.4	4.4	4.4	4.4	4.4	3.29
220	n/a	n/a	n/a	n/a	n/a	n/a	n/a
240	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Perform R

b→a

Thickness [mm]	REI 15	REI 30	REI 45	REI 60	REI 90	REI 120
60	3.29	3.29	-	-	-	-
80	3.29	3.29	-	-	-	-
100	4.4	4.4	4.4	4.4	4.4	4.4
120	4.4	4.4	4.4	4.4	4.4	4.4
133	n/a	n/a	n/a	n/a	n/a	n/a
150	4.4	4.4	4.4	4.4	4.4	4.4
172	4.4	4.4	4.4	4.4	4.4	4.4
200	4.4	4.4	4.4	4.4	4.4	4.4
220	n/a	n/a	n/a	n/a	n/a	n/a
240	n/a	n/a	n/a	n/a	n/a	n/a

* Check for availability
n/a Product not available
- Data not available

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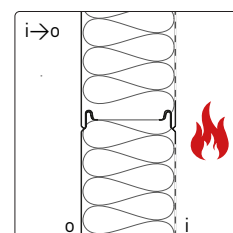
C

C3 Sound-absorbing acoustic panel

Trimoterm Sound

VERTICAL / HORIZONTAL INSTALLATION

Distances determined on the basis of fire resistance assesment.



Power T

i→o

Thickness [mm]	EI 15		EI 30		EI 45		EI 60		EI 90	
	V	H	V	H	V	H	V	H	V	H
120	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	4
133	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	4
150	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	4
172	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	4
200	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	4
220	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
240	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	4

Value in only valid if the fire is on the perforation side (on the cold side the steel should be non-perforated).

n/a Product not available
 - Data not available

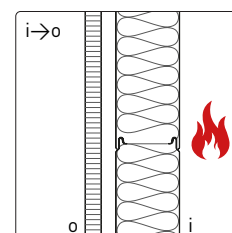
C

C.4 Backing wall panel

Trimoterm FTV

VERTICAL / HORIZONTAL INSTALLATION

Distances determined on the basis of fire resistance test.



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Power T (VERTICAL)

i→o

	EI 15	EI 30	EI 45	EI 60	EI 90
Thickness [mm]	V	V	V	V	V
150	7	7	7	7	6
172	7	7	7	7	6
200	7	7	7	7	6
220	7	7	7	7	6
240	7	7	7	7	6

For secondary façade weight up to 45 kg/m2

Power S

i→o

	EI 15		EI 30		EI 45		EI 60		EI 90		EI 120	
Thickness [mm]	V	H	V	H	V	H	V	H	V	H	V	H
150	7	7	7	7	7	7	7	7	7	7	7	7
172	7	7	7	7	7	7	7	7	7	7	7	7
200	7	7	7	7	7	7	7	7	7	7	7	7
220	7	7	7	7	7	7	7	7	7	7	7	7
240	7	7	7	7	7	7	7	7	7	7	7	7

For secondary façade weight up to:

- Vertical installation: 85 kg/m2

- Horizontal installation: 30 kg/m2



C

C.5 Ceiling

C.5.1 Trimoterm FTV

SELF-SUPPORTING CEILINGS

Distances determined on the basis of fire resistance tests.

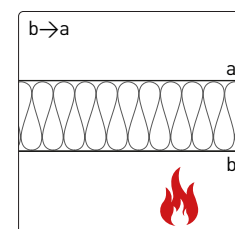
Perform C / Power S

b→a

LONGITUDINAL JOINT STITCHING – SINGLE SPAN

Fire Class	EI 15		EI 30		EI 60		EI 90		EI 120	
Thickness (T)	span (m)	screw*	span (m)	screw*	span (m)	screw*	span (m)	screw*	span (m)	screw*
100	4.2	3	4.2	3	4.2	3	4.2	3	4.2	3
120	6.5	8	6.5	8	6.5	8	5.04	5	4.2	3
133	4.2	4	4.2	4	4.2	4	4.2	4	4.2	4
150	5	4	5	4	5	4	5	4	5	4
172	5	4	5	4	5	4	5	4	5	4
200	5	4	5	4	5	4	5	4	5	5

* Number of fixation points per one side of a panel – valid for panel width 1000 mm



b→a

NO JOINT STITCHING

Fire Class	EI 30	
Thickness (T)	span (m)	screw*
100	4.2	3
120	4.2	3
133	4.2	4
150	4.2	4
172	4.2	5
200	4.2	5

Power T

b→a

LONGITUDINAL JOINT STITCHING – SINGLE SPAN

Fire Class	EI 15		EI 30		EI 60		EI 90	
Thickness (T)	span (m)	screw*	span (m)	screw*	span (m)	screw*	span (m)	screw*
100	7.16	10	5.74	6	4.4	4	4.4	3
120	4.4	4	4.4	4	4.4	4	4.4	4
133	4.4	4	4.4	4	4.4	4	4.4	4
150	4.4	4	4.4	4	4.4	4	4.4	4
172	4.4	4	4.4	4	4.4	4	4.4	4
200	4.4	5	4.4	5	4.4	5	4.4	5

* Number of fixation points per one side of a panel – valid for panel width 1000 mm

b→a

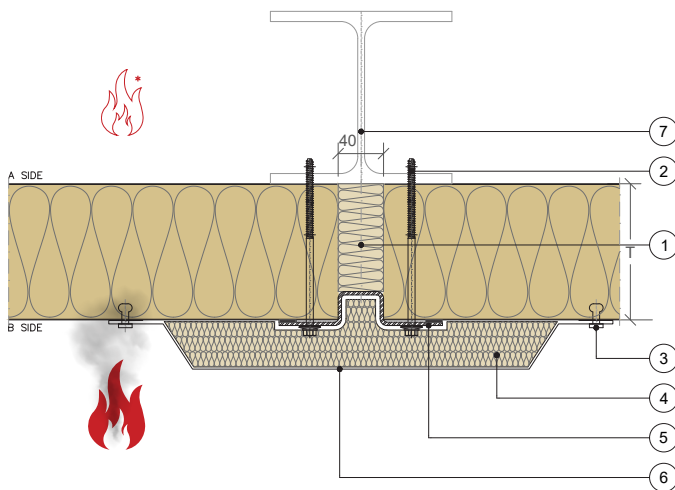
NO JOINT STITCHING

Fire Class	EI 30	
Thickness (T)	span (m)	screw*
100	4.2	3
120	4.2	4
133	4.2	4
150	4.2	4
172	4.2	4
200	4.2	5

C

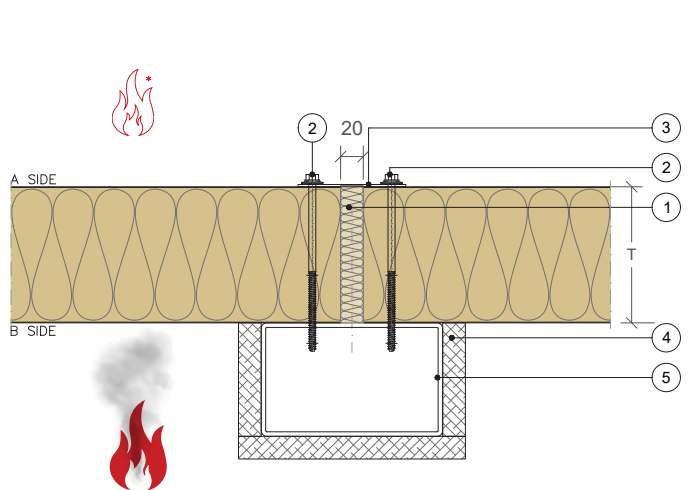
LONGITUDINAL SECTION SCHEMES

OPTION 1: Fixing from below



- 1 Stonewool (density 100 kg/m³)
- 2 Screw
- 3 Rivet
- 4 Fire-resistant material -> thickness design according to material delivery (optionally stonewool with density 100 kg/m³)
- 5 Omega profile 55 x 30 x 40 x 30 x 55 x 3 mm
- 6 Flashing
- 7 Load-bearing structure

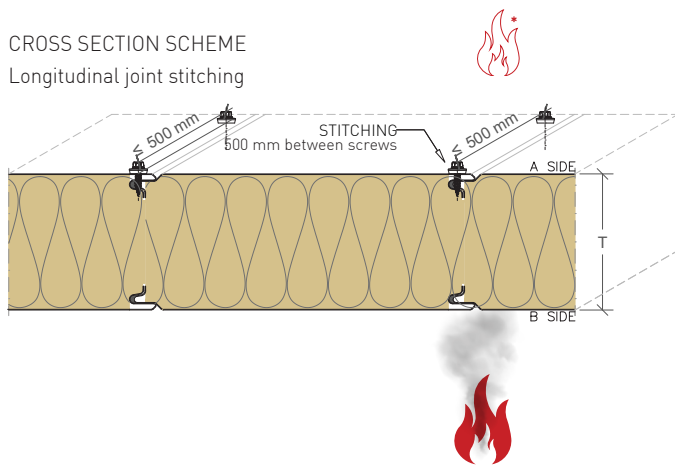
OPTION 2: Fixing from above



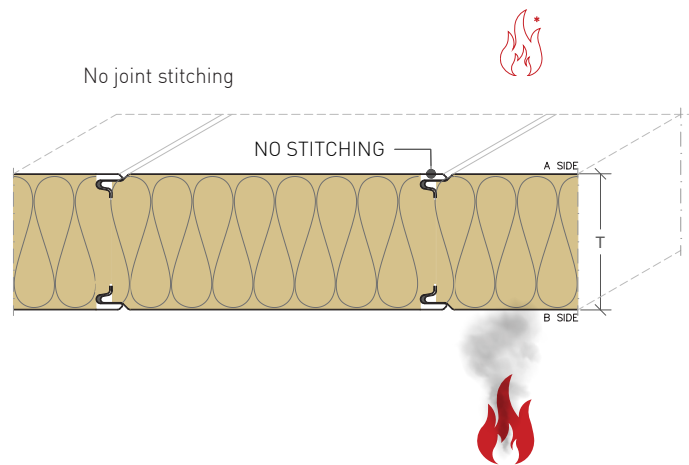
- 1 Stonewool (density 100 kg/m³)
- 2 Screw
- 3 Galvanised steel plate T= 2 mm
- 4 Fire-resistant material -> thickness design according to material delivery
- 5 Load-bearing structure

CROSS SECTION SCHEME

Longitudinal joint stitching



No joint stitching



* If the support structure and fixing systems are protected in such a way that the temperature increase in these will not influence the behaviour of the ceiling panels, then EXAP rules [EN 15254-7] allows application in both directions.

C

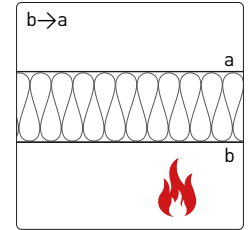
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C.5 Ceiling

C.5.2 Trimoterm FTV HL

SELF-SUPPORTING CEILINGS

Distances determined on the basis of fire resistance test.



Perform C / Power S

b→a

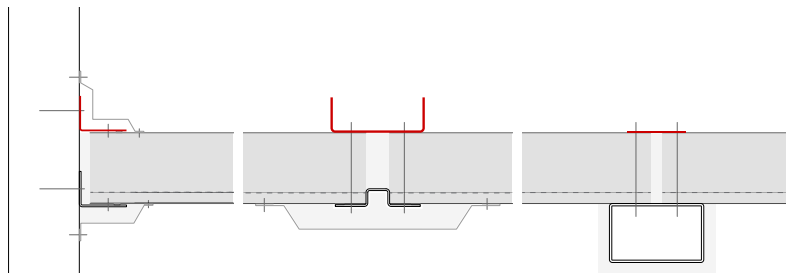
NO JOINT STITCHING - MULTISPAN - MAX. 2 SPANS ALLOWED.***

Fire Class	EI 15		EI 30		EI 60		EI 90	
Thickness (T)	span (m)	screw*	span (m)	screw*	span (m)	screw*	span (m)	screw*
80	2.8	6 + 2**	2.8	6 + 2**	2.6	6 + 2**	2.1	3 + 1**
100	2.1	4 + 2**	2.1	4 + 2**	2.1	4 + 2**	2.1	3 + 1**
120	2.1	5 + 2**	2.1	5 + 2**	2.1	5 + 2**	2.1	5 + 2**
133	2.1	5 + 2**	2.1	5 + 2**	2.1	5 + 2**	2.1	5 + 2**
150	2.1	5 + 2**	2.1	5 + 2**	2.1	5 + 2**	2.1	5 + 2**
172	2.1	6 + 2**	2.1	6 + 2**	2.1	6 + 2**	2.1	6 + 2**
200	2.1	6 + 2**	2.1	6 + 2**	2.1	6 + 2**	2.1	6 + 2**

* Number of fixation points per one panel extremity – visible fixing – valid for panel width of 1000 mm.

** Number of screws on the hidden fixing point – Invisio plate – valid for panel width 1000 mm.

*** Difference in span length of a multi span panel: L max = L min x 10 %



Metal sheet fixed to panels' upper steel sheet forming a continuous plane.

NOTES FOR INSTALLERS

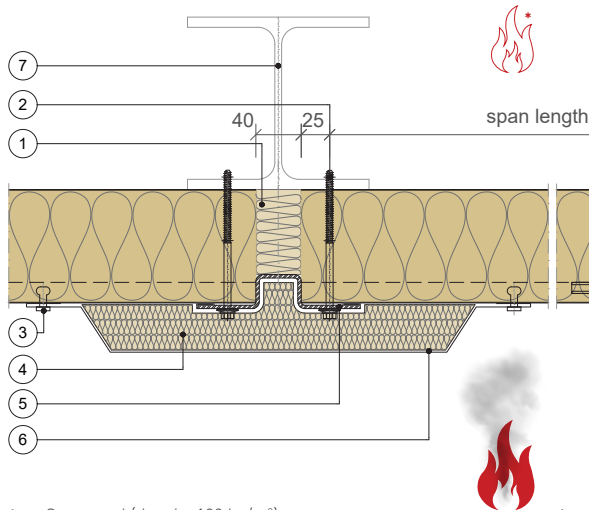
Installers must pay close attention during execution. In some cases, due to fire safety requirements, on the top side the panels' outer steel sheet is connected with the metal sheets to form a continuous plane.

For this reason, it is important that the details are executed correctly (metal sheet at the panel joint; longitudinal seaming; metal sheet at suspended ceilings).

C

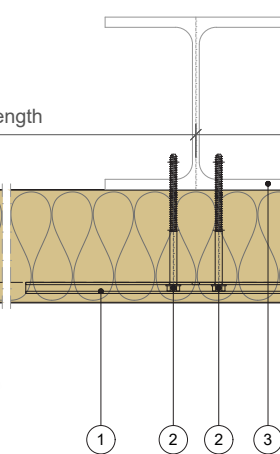
LONGITUDINAL SECTION SCHEMES

OPTION 1: Fixing from below



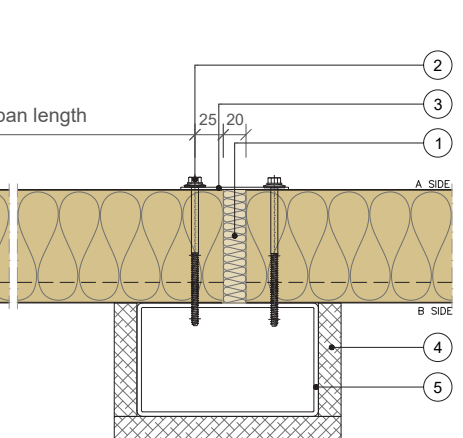
- 1 Stonewool (density 100 kg/m³)
- 2 Screw
- 3 Rivet
- 4 Fire-resistant material
-> thickness design according to material delivery
(optionally stonewool with density 100 kg/m³)
- 5 Omega profile 55 x 30 x 40 x 30 x 55 x 3 mm
- 6 Flashing
- 7 Load-bearing structure

Intermediate support



- 1 FTV HL Spreader plate
- 2 Screw
- 3 Load-bearing structure

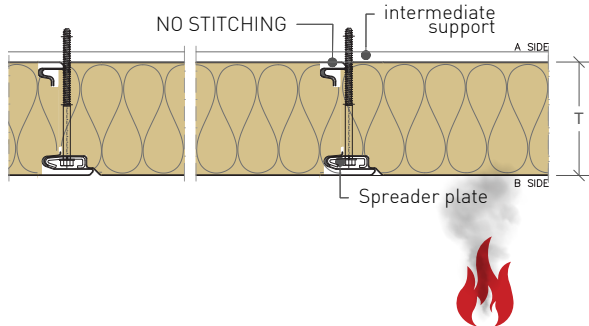
OPTION 2: Fixing from above



- 1 Stonewool (density 100 kg/m³)
- 2 Screw
- 3 Galvanised steel plate T= 2 mm
- 4 Fire-resistant material -> thickness design
according to material delivery
- 5 Load-bearing structure

CROSS SECTION

No joint stitching



* If the support structure and fixing systems are protected in such a way that the temperature increase in these will not influence the behaviour of the ceiling panels, then EXAP rules (EN 15254-7) allows application in both directions.

GLOSSARY

self-supporting ceiling

ceiling without any additional hangers between supports

suspended ceiling

ceiling which is suspended from a supporting structure

C

C.5 Ceiling

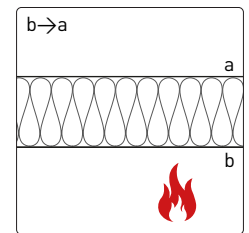
C.5.3 Trimoterm FTV

SUSPENDED CEILINGS

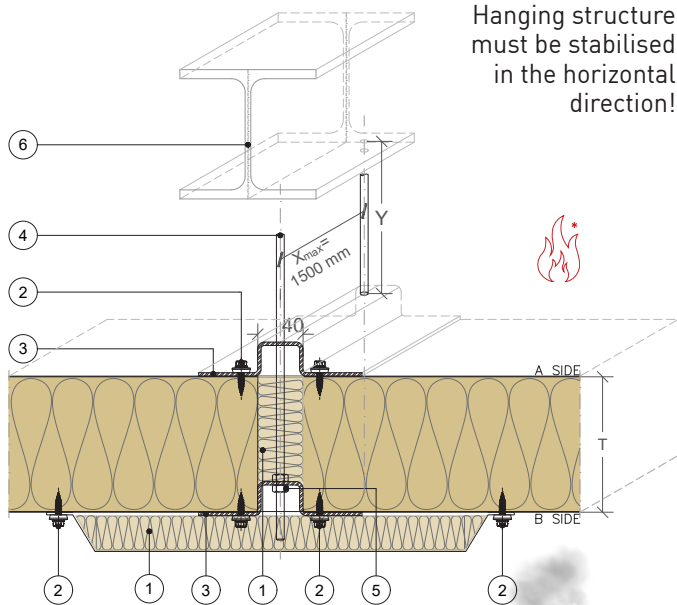
Power T

b→a

Tested panel thickness	120 mm
Tested span	3050 mm
Maximum fire resistance	EI 120 (with stitching)
Walkability	No
EXAP	No
Thickness variations	Contact technical support



LONGITUDINAL SECTION SCHEME

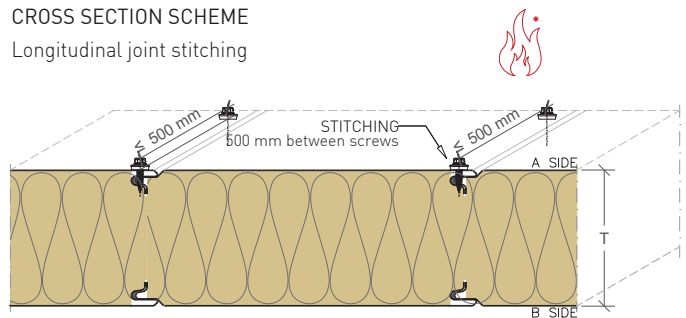


- 1 Stonewool (density 100 kg/m³)
- 2 Screw (with washer) SFS fi 6,5 x 20
- 3 Omega profile 55 x 30 x 40 x 30 x 55 x 3 mm
- 4 Hanging rods
- 5 Fixing nut
- 6 Load-bearing structure

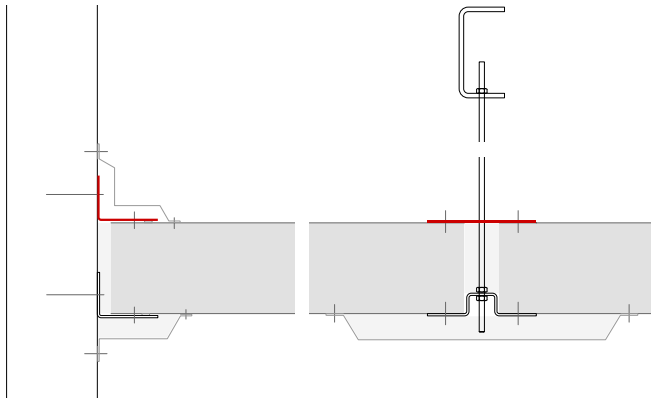
* If the support structure and fixing systems are protected in such a way that the temperature increase in these will not influence the behaviour of the ceiling panels, then EXAP rules [EN 15254-7] allows application in both directions.

CROSS SECTION SCHEME

Longitudinal joint stitching



C



Metal sheet fixed to panels' upper steel sheet forming a continuous plane.

NOTES FOR INSTALLERS

Installers must pay close attention during execution. In some cases, due to fire safety requirements, on the top side the panels' outer steel sheet is connected with the metal sheets to form a continuous plane.

For this reason, it is important that the details are executed correctly (metal sheet at the panel joint; longitudinal seaming; metal sheet at suspended ceilings).

NOTES!

- The support structure shall have at least the same load-bearing capacity (R) in the fire resistance performance as the sandwich panel ceiling regarding insulation and integrity (EI).
- The fixing system and support structure shall have the sufficient load-bearing capacity to support the ceiling (weight of the panel and catenary force) for the fire resistance period.





D

Fire penetrations in internal walls

Due to the nature of the building industry, penetrations are a commonplace. The Trimoterm sandwich panel is able to sustain many different cut-outs for windows, doors, and various installation penetrations.

Panels are designed to support themselves. However, making holes or cuts in a panel weakens its strength. The extent of this weakening depends on the size of the cut, which also influences how the panel needs to be reinforced.

Further, for different purposes of penetration (cables, pipes, doors etc.), different setups were tested and certified in cooperation with Nullifire, Cimesa, and Roxtec.

By following the reinforcement recommendations and utilising the presented penetration setups, you can confidently design fire-resistant walls that accommodate any type of penetration.

SUPPORTING INFORMATION!

All support elements shall be structurally checked regarding project situation/loads.

The recommendations shall be used as information regarding possible principles of penetration system solutions for Trimo panels. For real cases it needs to be discussed individually with Trimo technical support.

D

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D.1 Trimoterm panels with penetration

Any type of cut-out creates a weak point in the panel. In the following chapter, we will discuss situations where a cut-out does not significantly weaken the panel and can be used without additional reinforcements, as well as situations where different types of reinforcements are necessary.

D.1.1 Cut-out without additional reinforcement

Trimoterm panels installed as internal walls can withstand openings without additional reinforcement, typically for small penetrations with dimensions of no more than 200 mm.

This section outlines the guidelines for managing fire penetrations that do not need additional reinforcement. It includes general instructions along with selected examples.

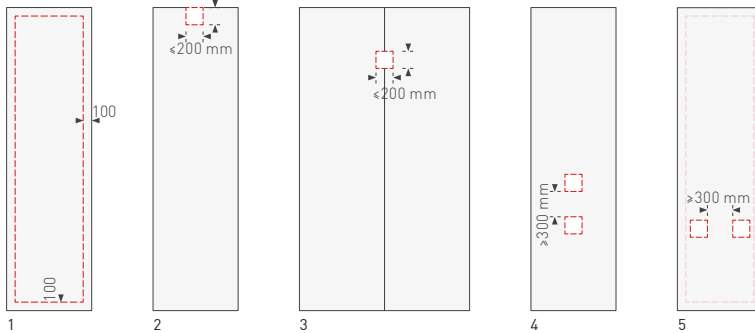
Reinforcement of the elements due to fire load is based on engineering approach, according to fire resistance test. For more information, contact our technical support (technical@trimo-group.com).

SUPPORTING INFORMATION!

The fire resistance of penetration systems for cables, pipes, ventilation ducts etc. is under the full responsibility of installer, including selection & design, installation and marking and labelling.

All fire-resistant penetrations shall be designed and executed in compliance with the valid legislation and the technical properties of the materials.

Reinforcement type 0 - Cut-out without additional reinforcement



- 1 Within 100 mm from the panel border
- 2 Aligned with the panel edge (modules > 1000 mm). Maximum penetration ≤ 200 mm.
- 3 Central to the joint (2/3 of panel width must be intact). Maximum penetration ≤ 200 mm.
- 4 Between penetrations min. 300 mm
- 5 Between penetrations min. 300 mm, 2/3 of panel width must be intact.

D

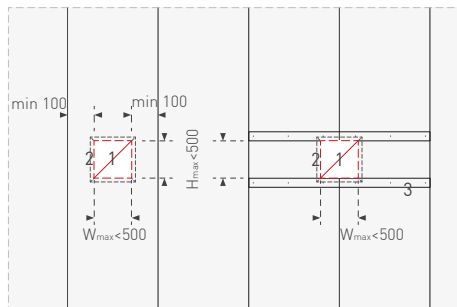
D.1.2 Cut-out openings with additional reinforcement

A panel cut-out is reinforced with a welded frame, and for larger dimensions, it also includes a supportive structure that distributes the load to other panels or directly to the main construction. The following pages explain the different types of reinforcements based on the cut-out dimensions.

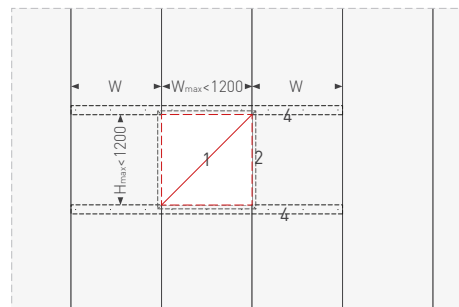
Cut-out max dimensions [mm]				
Reinforcement type	Width	Height	Max load (F) [N]	Construction principle
O	200	200	100	No frame requested
A	500	500	100	L-profile frame (both panel sides)
B	1200	1200	300	L-profile frame (both panel sides), load distribution profile horizontal (min. 3 cut out size widths)
C	1200	1200	Limited by load bearing fire resistant structure	L-profile frame (both panel sides), load distribution profile vertical - connected to the main building structure
D	>1200	>1200	Limited by load bearing fire resistant structure	L-profile frame, load distribution profile horizontal and vertical - connected to main building structure

Recommendations for panel cut-out reinforcement - fire-resistant sandwich internal walls Trimoterm

Reinforcement type A

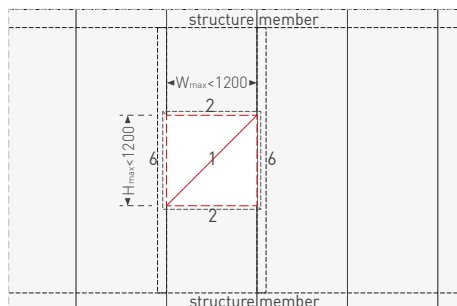


Reinforcement type B



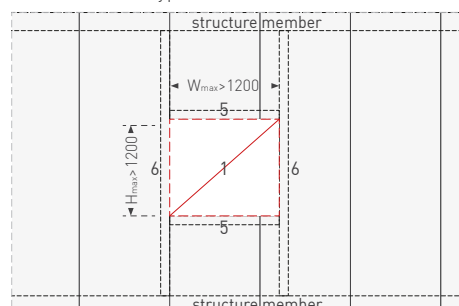
OPENING IN PANEL MODULE
RECOMMENDED

Reinforcement type C



OPENING IN PANEL MODULE
RECOMMENDED

Reinforcement type D



- 1 Opening
- 2 L-profile frame
- 3 Reinforced profile
- 4 Load spread profile
- 5 Load-bearing structure
- 6 Load-bearing construction connection

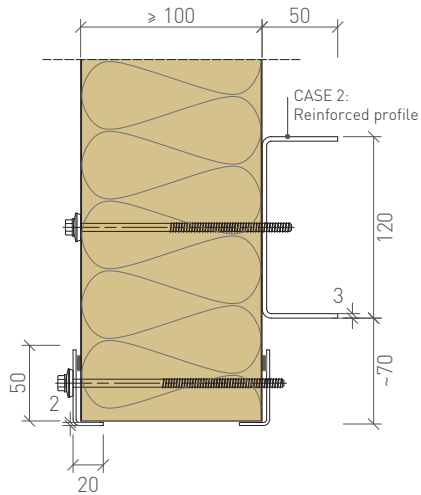
D

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TRIMOTERM FTV Internal wall reinforcement type A

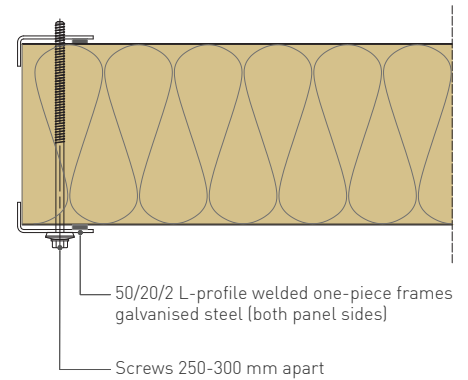
VERTICAL INSTALLATION

TOP DETAIL

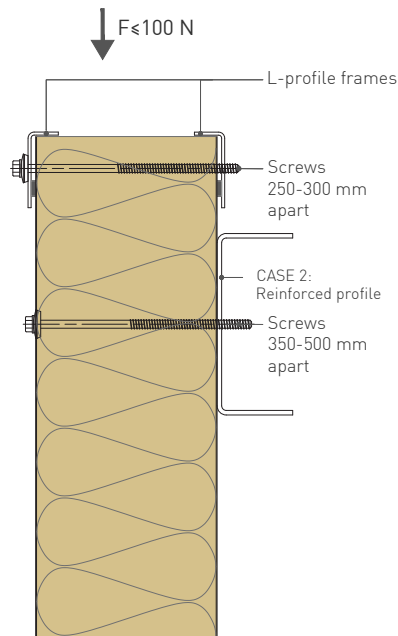


SIDE DETAIL

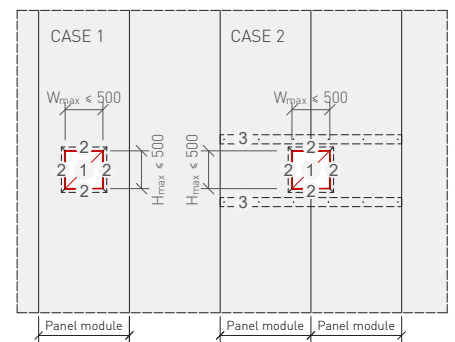
$W / H \max \leq 500 \text{ mm}$



BOTTOM DETAIL



WALL SCHEME



- 1 Opening
- 2 L-profile welded one-piece galvanised steel frames
- 3 Reinforced profile

M 1:5

NOTES:

1. Fire resistance to penetration is the installer's responsibility
2. All the drawn elements must be structurally checked
3. Detail is schematic.
4. In case multiple penetration occur in the same zone, individual check cases are needed
5. Structure works the same way in case that two (or more) panels are involved
6. Max load to cut out not limited in case load is transferred to vertical load-bearing connections
7. All steel elements should achieve the same fire resistance as for sandwich element requirements

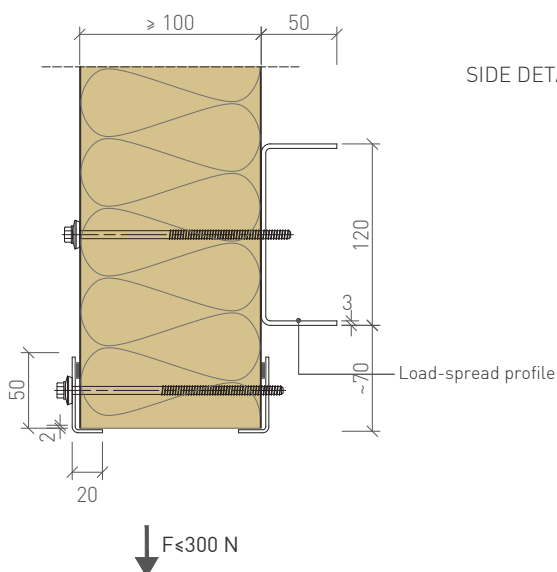
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TRIMOTERM FTV Internal wall reinforcement type B

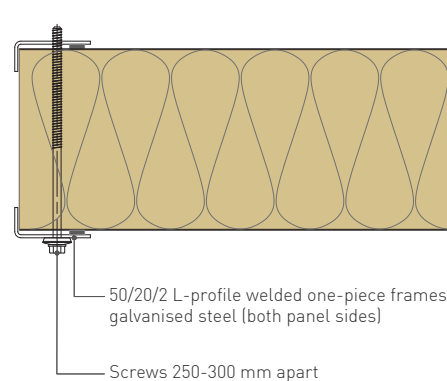
VERTICAL INSTALLATION

TOP DETAIL

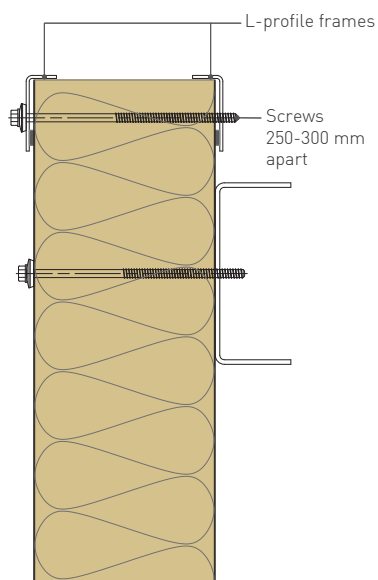


SIDE DETAIL

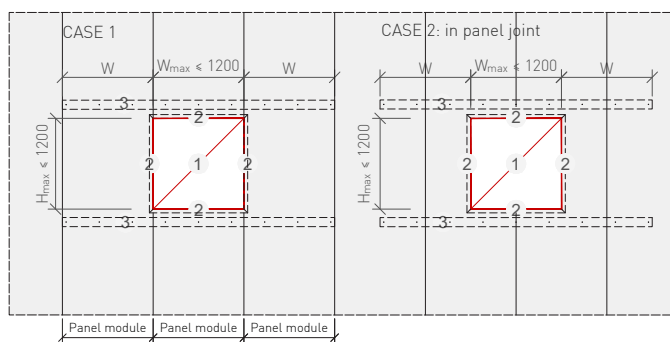
$W / H \max \leq 1200 \text{ mm}$



BOTTOM DETAIL



WALL SCHEME



- 1 Opening
- 2 L-profile welded one-piece galvanised steel frames
- 3 Load spread profile

M 1:5

NOTES:

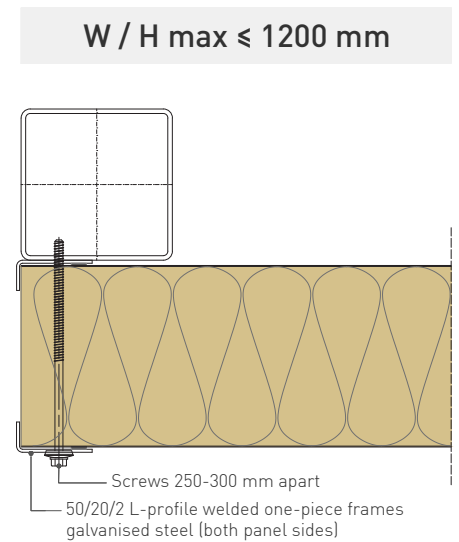
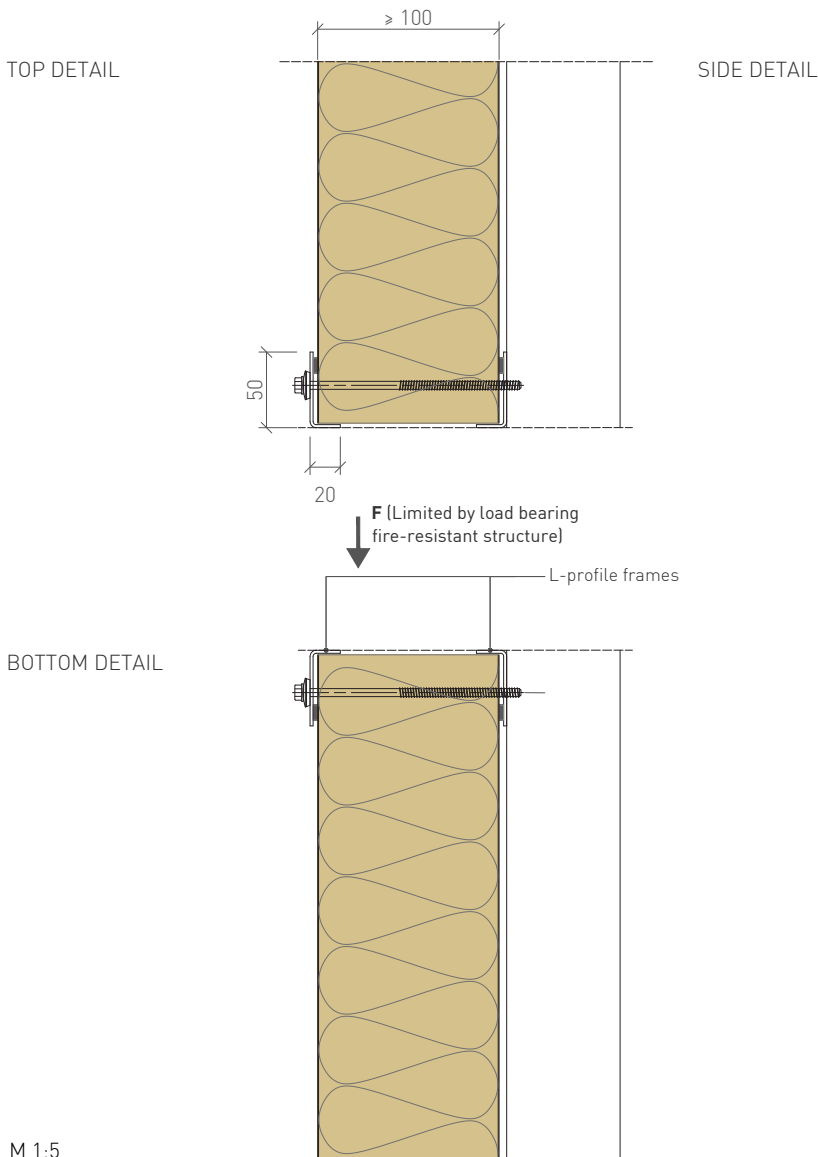
1. Fire resistance to penetration is the installer's responsibility
2. All the drawn elements must be structurally checked
3. Detail is schematic.
4. In case multiple penetration occur in the same zone, individual check cases are needed
5. Structure works the same way in case that two (or more) panels are involved
6. Max load to cut out not limited in case load is transferred to vertical load-bearing connections
7. All steel elements should achieve the same fire resistance as for sandwich element requirements

D

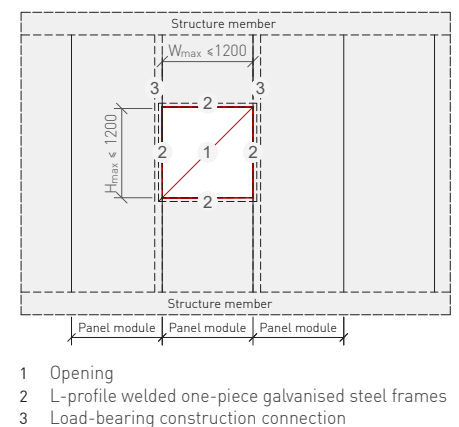
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TRIMOTERM FTV Internal wall reinforcement type C

VERTICAL INSTALLATION



WALL SCHEME



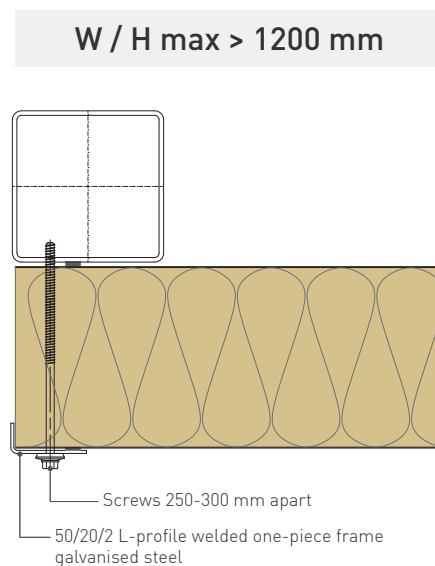
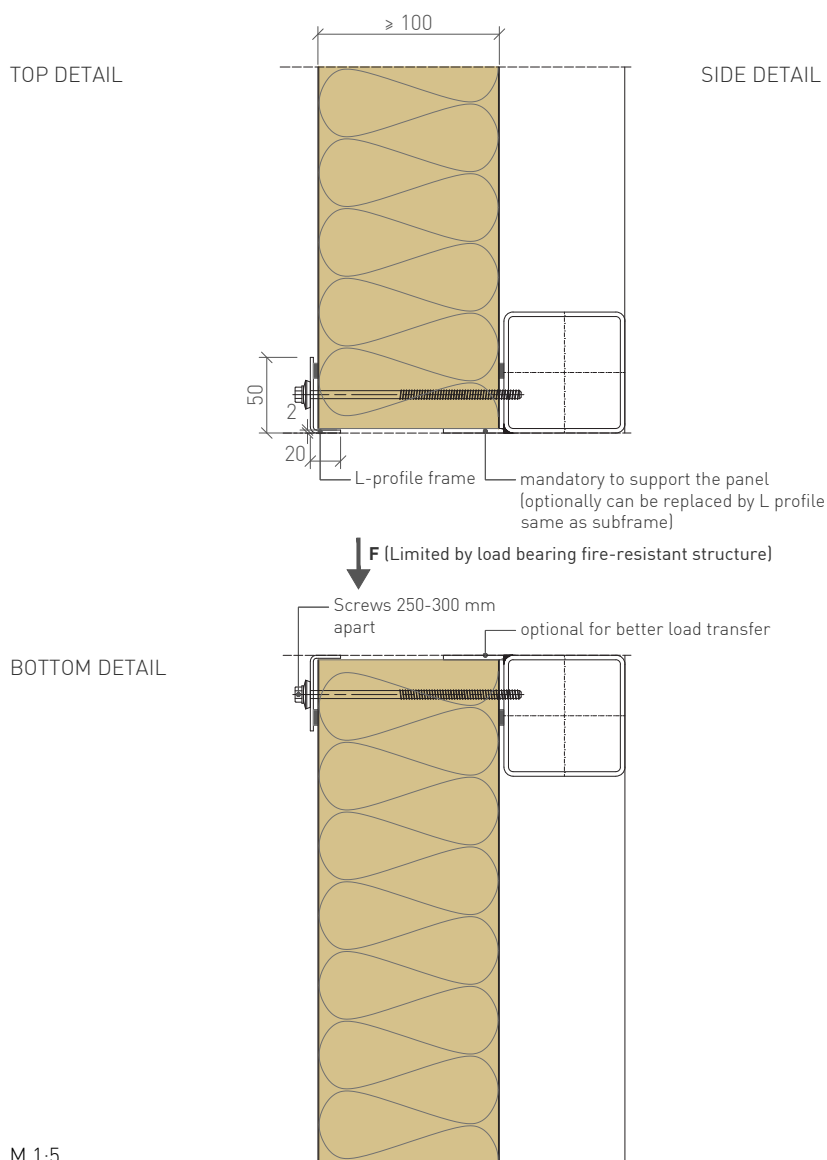
NOTES:

1. Fire resistance to penetration is the installer's responsibility
2. All the drawn elements must be structurally checked
3. Detail is schematic.
4. In case multiple penetration occur in the same zone, individual check cases are needed
5. Structure works the same way in case that two (or more) panels are involved
6. Max load to cut out not limited in case load is transferred to vertical load-bearing connections
7. All steel elements should achieve the same fire resistance as for sandwich element requirements

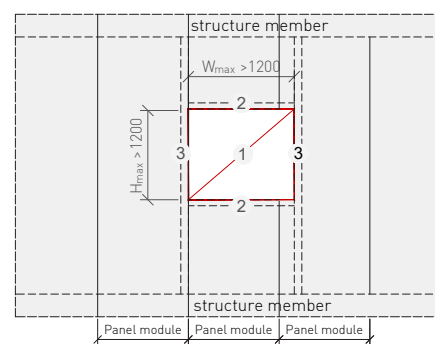
D

TRIMOTERM FTV Internal wall reinforcement type D

VERTICAL INSTALLATION



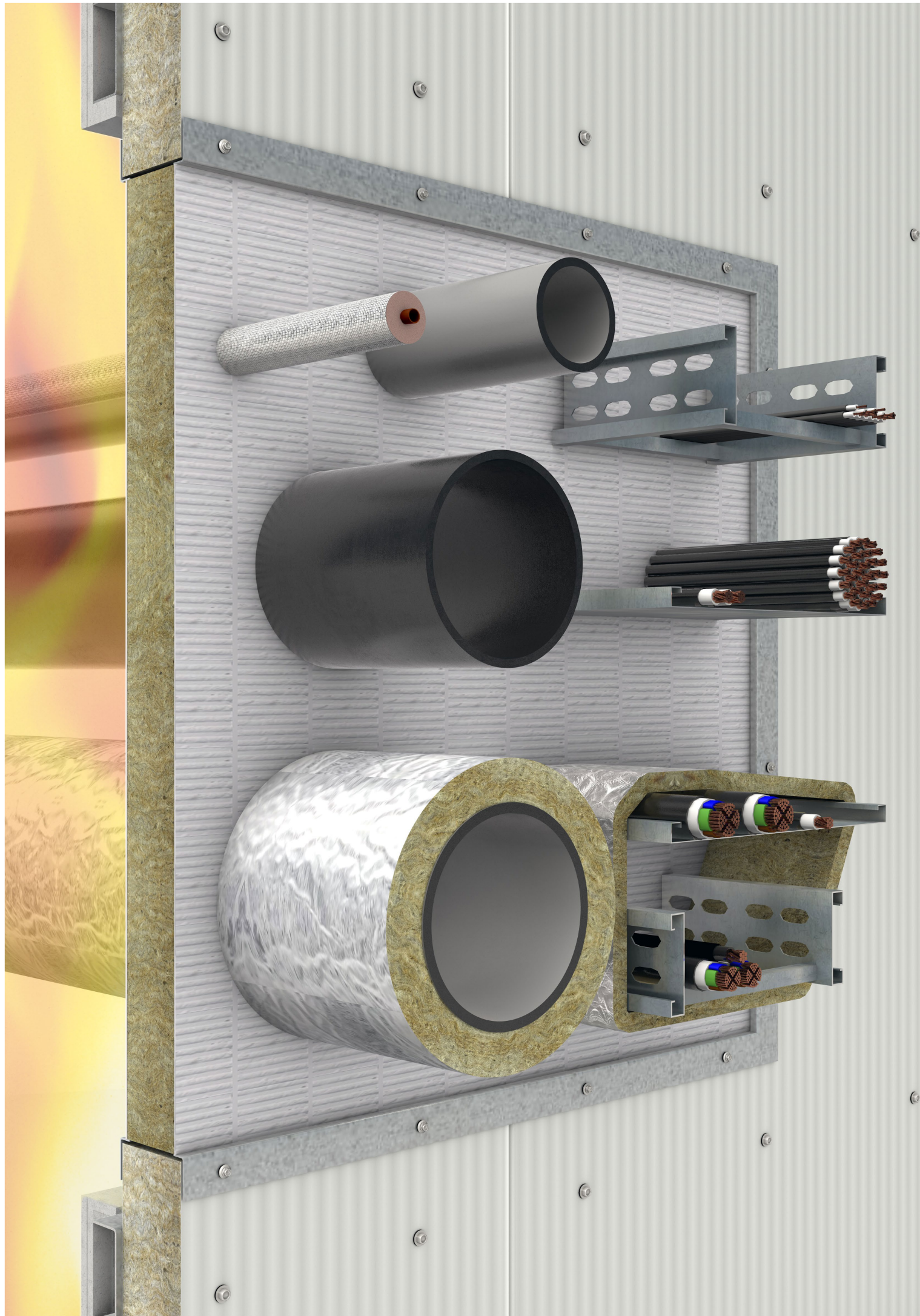
WALL SCHEME



- 1 Opening
- 2 Load-bearing profile
- 3 Load-bearing construction connection

NOTES:

1. Fire resistance to penetration is the installer's responsibility
2. All the drawn elements must be structurally checked
3. Detail is schematic.
4. In case multiple penetration occur in the same zone, individual check cases are needed
5. Structure works the same way in case that two (or more) panels are involved
6. Max load to cut out not limited in case load is transferred to vertical load-bearing connections
7. All steel elements should achieve the same fire resistance as for sandwich element requirements



D

D.2 Penetration seals

When installing building components such as electrical cables or various pipes that penetrate a fire-rated interior wall, it is crucial to ensure proper fireproof sealing. The process involves several key steps:

- **Cut-Out Creation:** Begin by making an opening in the interior wall as detailed in the previous chapter.
- **Installation:** Next, install the cables or pipes through the prepared opening.
- **Sealing:** The most critical step is to seal the remaining space around the cables or pipes to maintain the fire resistance of the wall.

The fire tests for the configurations presented in the following pages were conducted in collaboration between Trimo and Nullifire.

The configurations may not meet specific project requirements, so it's crucial for the customer or an expert to assess them against the actual criteria.

For any specific inquiries, please do not hesitate to contact us. We are here to assist you.

Pipe collars: Single cable/pipe penetration 30

Fibreboard: Electrical penetration cut-out opening sizes 32

Cable tray and ladder penetration

Cable ladder penetration

Cable tray penetration

Fibreboard: Pipe penetration cut-out opening sizes 38

Combustible pipe penetration (PP, PVC)

Copper pipe penetration

Steel pipe penetration

Steel pipe penetration (no intumescent pipe wrap layers)



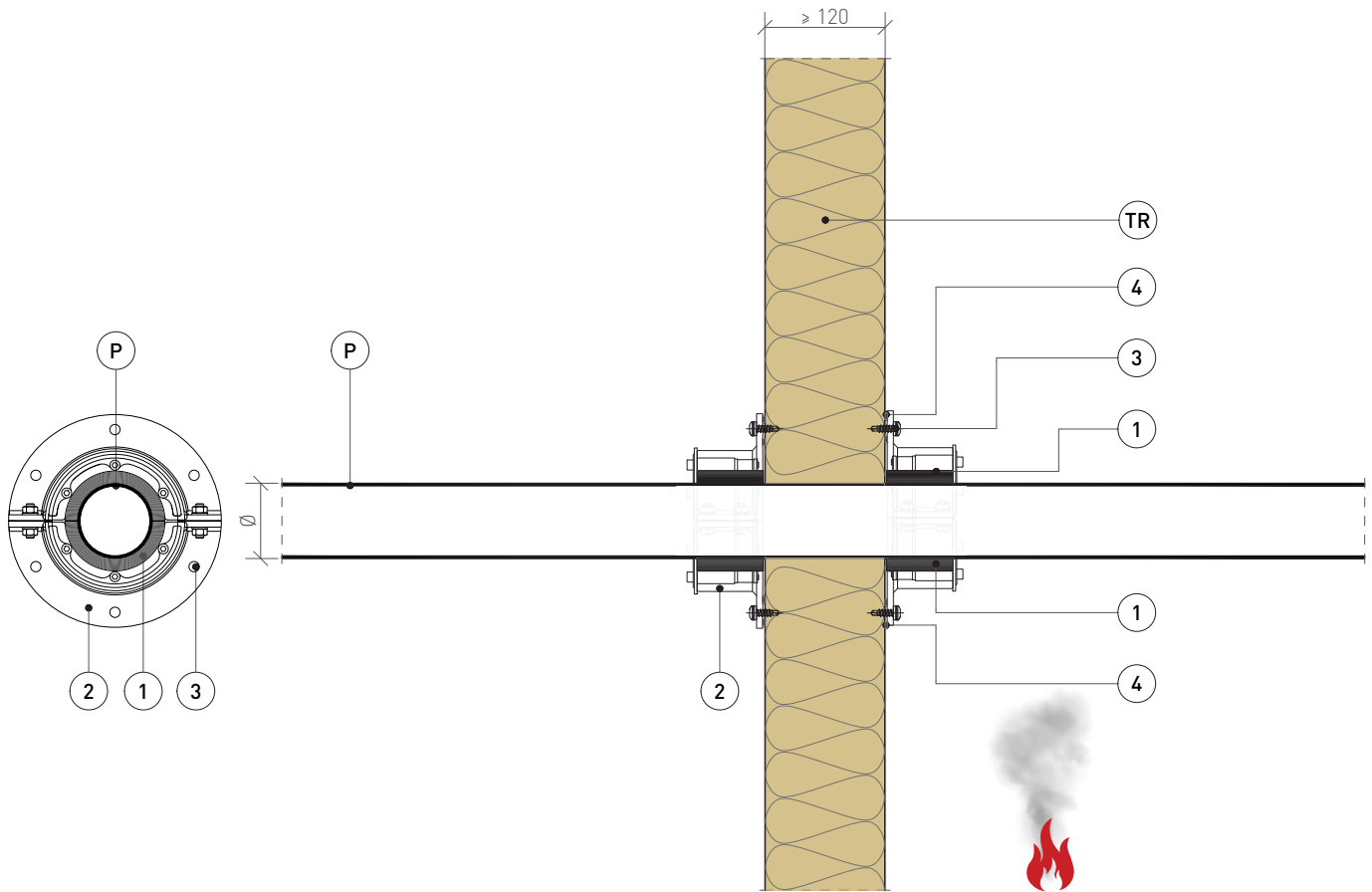
[Link to Trimoterm FTV Fire-resistant internal wall system details](#)

D

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D.2.1 Cable/pipe collar for single cable/pipe penetration

E	120
I	120, 90



- P Pipe
1 Seals
2 Sleeve
3 Self-tapping screws
4 Sealant / gasket
TR TRIMO panel system, panel width ≥ 120 mm

M 1:7.5

NOTES:

- Fire resistance test including determination of fire integrity and insulation was carried out according to the standards: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements and EN 1366-3:2022-05 - Fire resistance tests for service installations - Part 3: Penetration seals.
- The test was carried out in partnership between Trimo and Roxtec. For more information see Roxtec Data sheets and Installation instructions
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration** [↗](#).
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D

Distances

Distance to nearest penetration ≥ 100 mm

Distance to panel joint ≥ 100 mm

Integrity (E) and insulation (I)

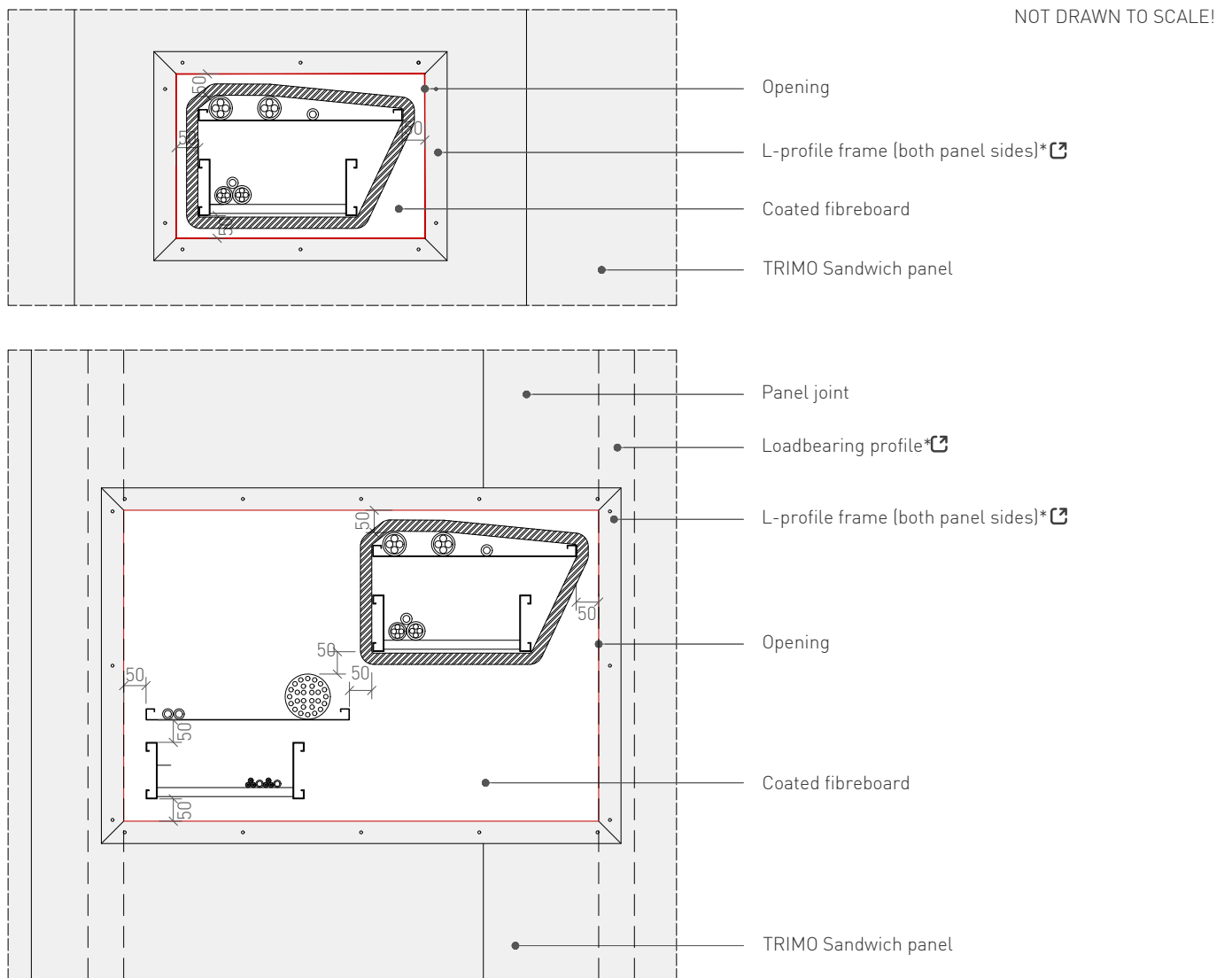
Pipe material	Ø [mm]	wall [mm]	E	I
PVC-U	25	1.9	120	120
	90	4.3	120	120
	110	5.3	120	120
PE	63	5.8	120	120
PP	25	2.3	120	120
	32	1.8	120	120
	50	1.8	120	120
	50	4.6	120	120
	75	2.6	120	120
	110	3.2	120	90

E/I rating according to EN 13501

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D.2.2 Fibreboard / Electrical penetrations cut-out opening sizes



NOTE:

* For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration** .

D

Opening sizes

Electrical penetrations max opening 1100 mm x 1100 mm.

Distance from the edge

≥ 50 mm edge for electrical penetrations

Distances between services (in mm)

	Substrate	Steel pipe	Combustible pipe	Cable tray	Trunking	Insulated pipe	Copper pipe
Trunking	0	30	50	50	50	50	100
Cable tray	0	30	50	30	50	30	100

All sizes above are measured from the outer edge of the services.
Cables can be bundled together into a maximum 100 mm diameter bundle and each bundle should be spaced 100 mm apart from each outer edge.

Integrity (E) and insulation (I)

Service	E	I
Cable tray and ladder	120	60
Cable ladder	120	90
Cable tray	120	60

E/I rating according to EN 13501

NOTES:

- Fire resistance test including determination of fire integrity and insulation was carried out according to the standards: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements and EN 1366-3:2022-05 - Fire resistance tests for service installations - Part 3: Penetration seals.
- Tested in partnership of Trimo and Nullifire. For more information see Nullifire Data sheets and Installation instructions.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration** [↗](#).

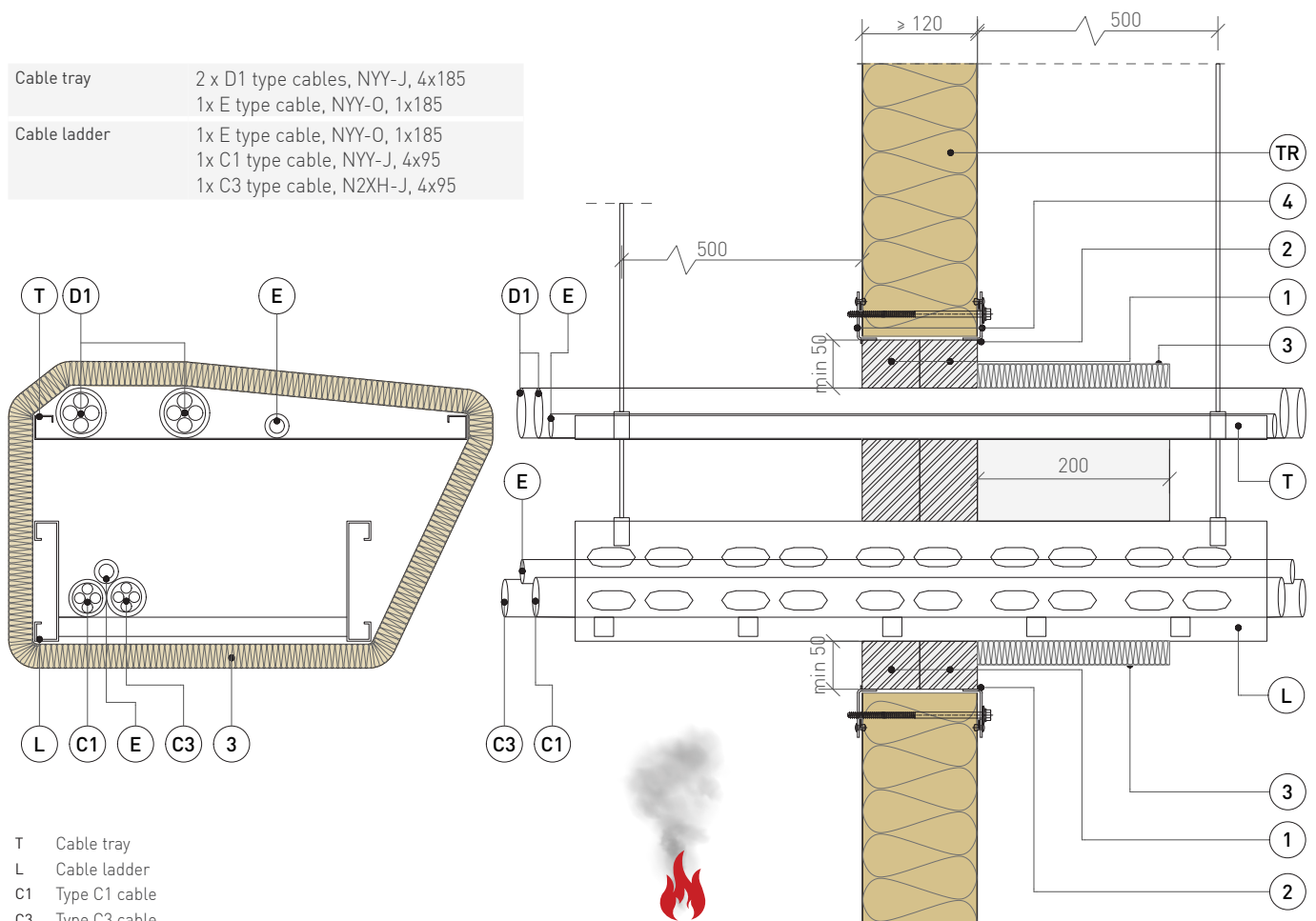
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D

D.2.2.1 Cable tray and ladder penetration

E	120
I	60

Cable tray	2 x D1 type cables, NYY-J, 4x185 1x E type cable, NYY-O, 1x185
Cable ladder	1x E type cable, NYY-O, 1x185 1x C1 type cable, NYY-J, 4x95 1x C3 type cable, N2XH-J, 4x95



- T Cable tray
- L Cable ladder
- C1 Type C1 cable
- C3 Type C3 cable
- D1 Type D1 cable
- E Type E cable
- 1 2 x 50 mm coated fibreboard
- 2 Fire-resistant acrylic sealant
- 3 200 x 25 mm Rock mineral fibre insulation
- 4 2 mm galv. steel aperture framing capping channel (L-profile 50/20/2)
- TR TRIMO panel system, panel width ≥ 120 mm

M 1:7.5

NOTES:

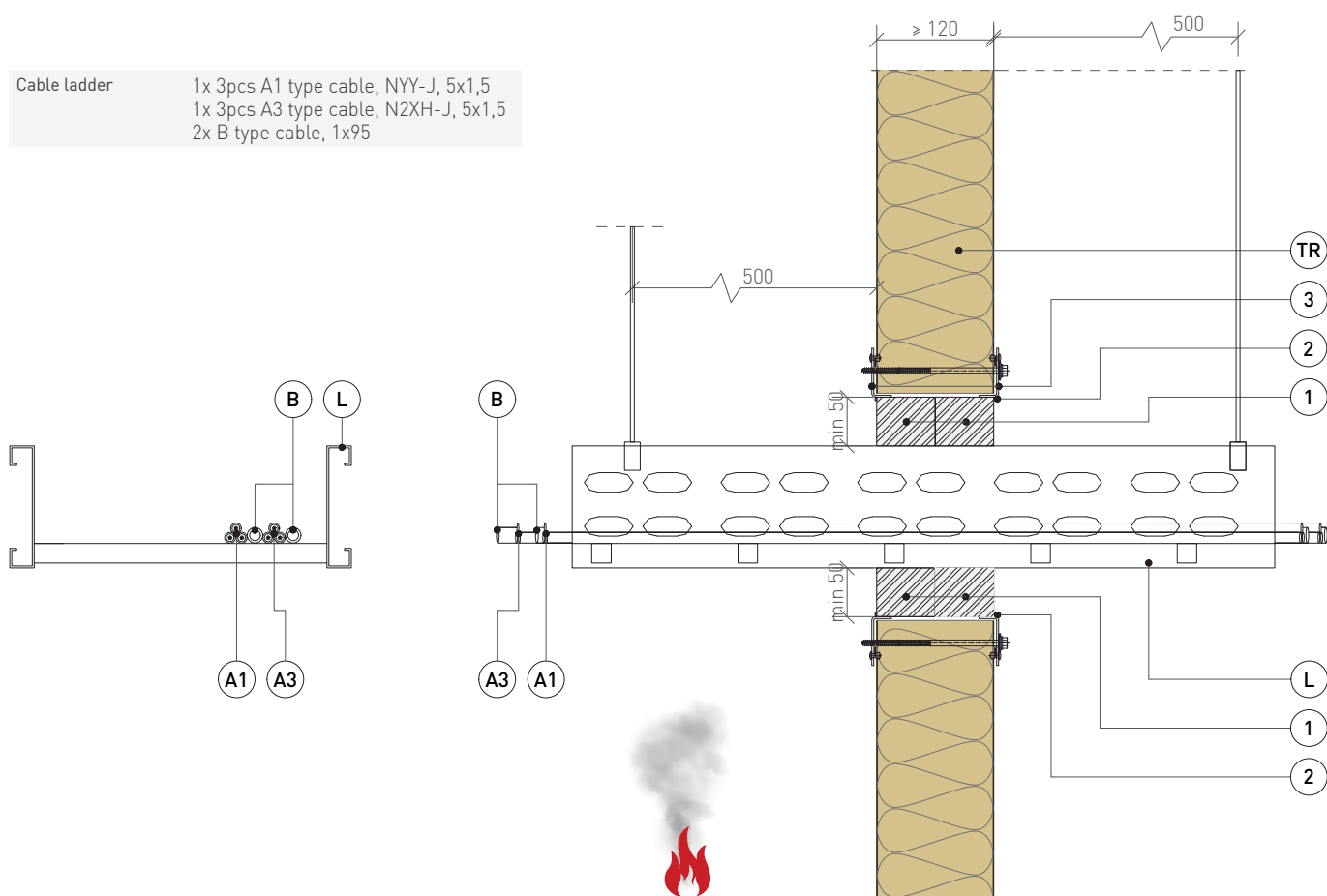
- Fire resistance test including the determination of fire integrity and insulation was carried out according to the standards: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements and EN 1366-3:2022-05 - Fire resistance tests for service installations - Part 3: Penetration seals.
- Tested in partnership between Trimo and Nullifire. For more information see Nullifire Data sheets and Installation instructions.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration**.
- Download Trimoterm FTV Fire-resistant internal wall system details [pdf](#) or [dwg](#)

D

D.2.2.2 Cable ladder penetration

E	120
I	90

Cable ladder	1x 3pcs A1 type cable, NYY-J, 5x1,5 1x 3pcs A3 type cable, N2XH-J, 5x1,5 2x B type cable, 1x95
--------------	--



L	Cable ladder
A1	Type A1 cable
A3	Type A3 cable
B	Type B cable
1	2 x 50 mm coated fibreboard
2	Fire-resistant acrylic sealant
3	2 mm galv. steel aperture framing capping channel (L-profile 50/20/2)
TR	TRIMO panel system, panel width ≥ 120 mm

M 1:7.5

NOTES:

- Fire resistance test including determination of fire integrity and insulation was carried out according to the standards: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements and EN 1366-3:2022-05 - Fire resistance tests for service installations - Part 3: Penetration seals.
- Tested in partnership between Trimoterm and Nullifire. For more information see Nullifire Data sheets and Installation instructions.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration**.
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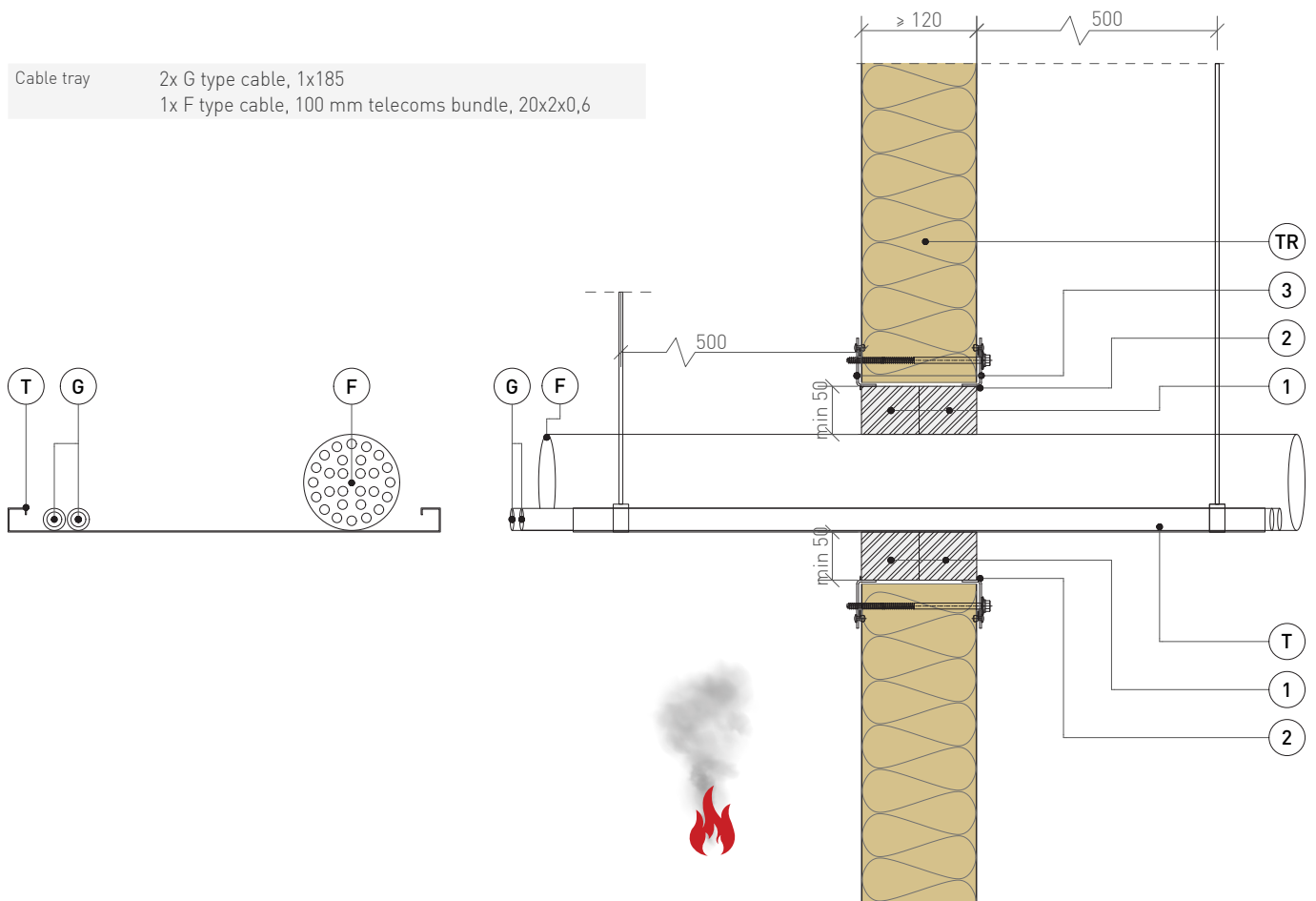
D

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D.2.2.3 Cable tray penetration

E	120
I	60

Cable tray
2x G type cable, 1x185
1x F type cable, 100 mm telecoms bundle, 20x2x0,6



- T Cable tray
- F Type F cable
- G Type G cable
- 1 2 x 50 mm coated fibreboard
- 2 Fire-resistant acrylic sealant
- 3 2 mm galv. steel aperture framing capping channel (L-profile 50/20/2)
- TR TRIMO panel system, panel width ≥ 120 mm

M 1:7.5

NOTES:

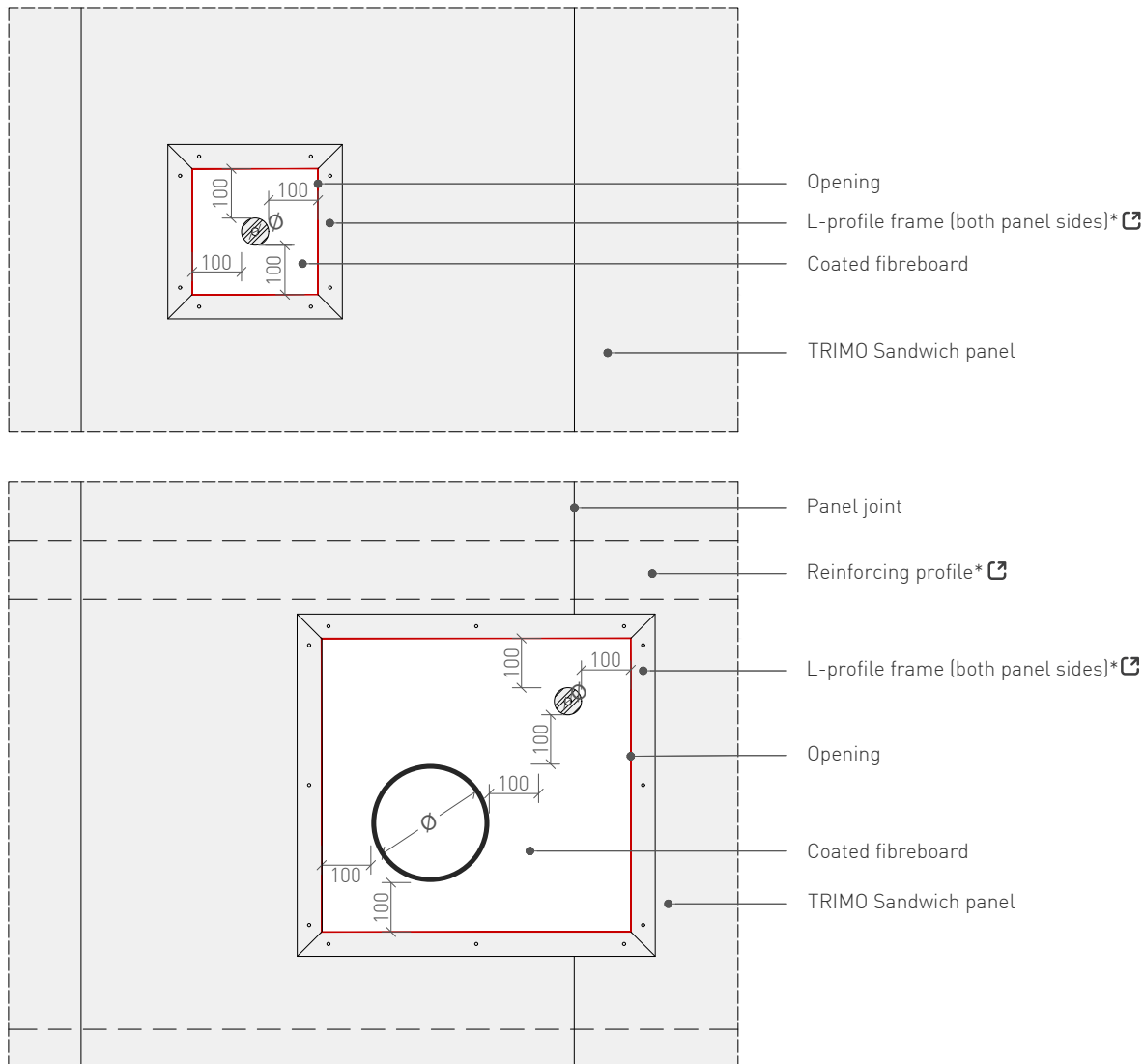
- Fire resistance test including determination of fire integrity and insulation was carried out according to the standards: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements and EN 1366-3:2022-05 - Fire resistance tests for service installations - Part 3: Penetration seals.
- Tested in partnership with Trimo and Nullifire. For more information see Nullifire Data sheets and Installation instructions.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration**.
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D.2.3 Fibreboard / Pipe penetrations cut-out opening sizes



NOTE:

* For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration**.

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D

Opening sizes

electrical penetrations max opening 2600 mm x 1050 mm

Distance from the edge

min 100 mm edge for Pipe penetrations

Distances between services (in mm)

	Dimension	Substrate	Steel pipe	Combustible pipe	Cable tray	Trunking	Insulated pipe	Copper pipe
Combustible pipe	< 55 mm	0	50	0 mm to same size	50	50	30	100
	55-110 mm	20	50	30 mm to same size	50	50	30	100
Insulated pipe		30	50	30	30	50	30	50
Copper pipe		30	30	100	100	100	50	30
Steel pipe		30	30	50	30	30	50	30

All sizes above are measured from the outer edge of the services.

Integrity (E) and insulation (I)

Pipe	Ø [mm]	Insulation [mm]	Intumescent pipe wrap layers	E	I
PP pipe	40 x 2	/	1	120	120
	110 x 10	/	3	120	120
	110 x 3,2	/	3	120	120
PVC pipe	110 x 10	/	3	120	120
Copper pipe	15	20*	2	120	120
Steel pipe	220 x 10	/	/	120	120
	40	20**	2	120	120
	110 x 10	50**	2	120	120

* Phenolic pipe insulation with foil

** Mineral wool pipe insulation with foil

E/EI rating according to EN 13501

NOTES:

- Fire resistance test including the determination of fire integrity and insulation was carried out according to the standards: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements and EN 1366-3:2022-05 - Fire resistance tests for service installations - Part 3: Penetration seals.
- Tested in partnership of Trimo and Nullifire. For more information see Nullifire Data sheets and Installation instructions.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration** [↗](#).

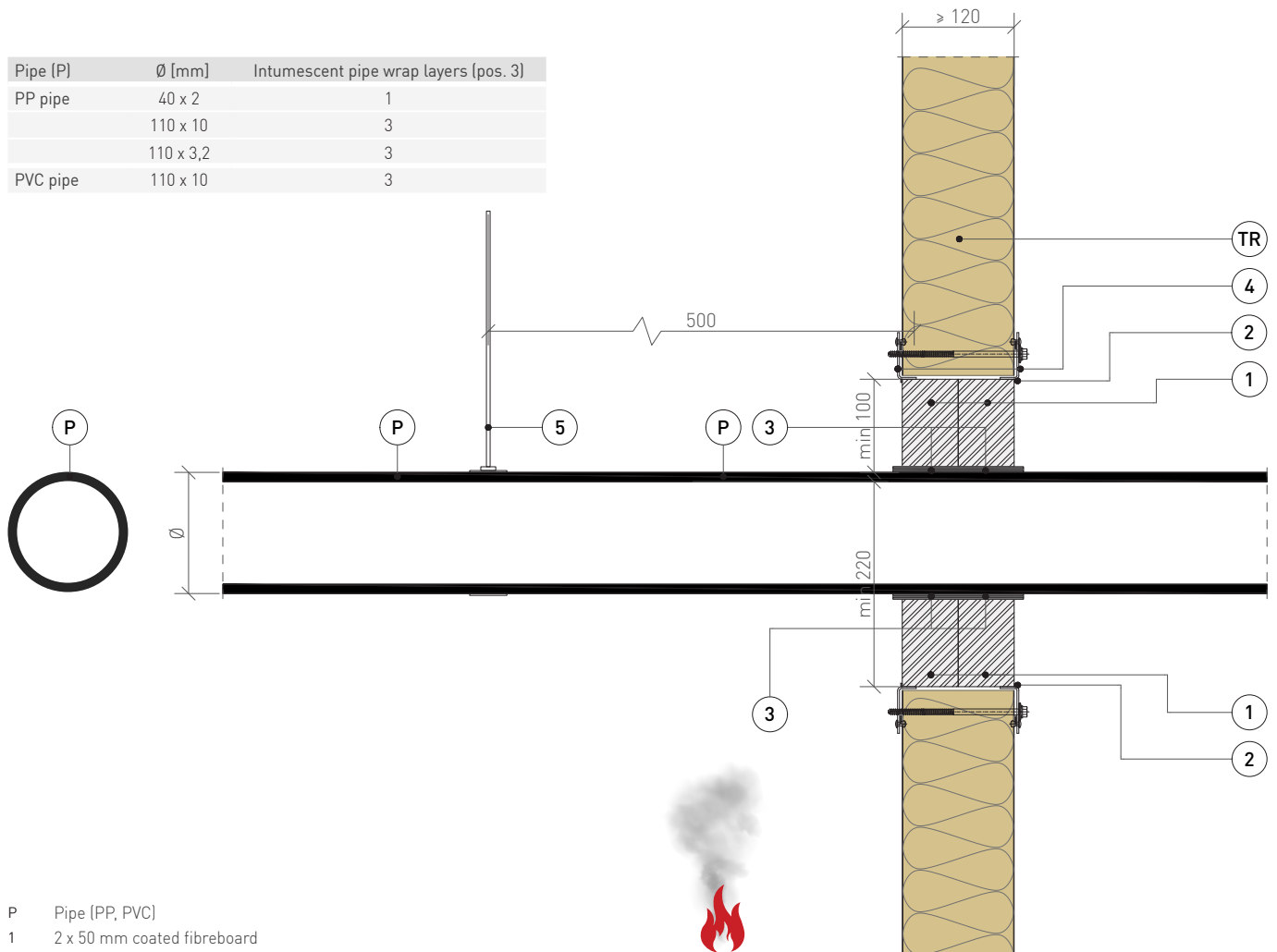
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D.2.3.1 Combustible pipe penetration

E	120
I	120



- P Pipe (PP, PVC)
- 1 2 x 50 mm coated fibreboard
- 2 Fire-resistant acrylic sealant
- 3 Intumescent pipe wrap layers (3 Layer 2 rows)
- 4 2 mm galv. steel aperture framing capping channel (L-profile 50/20/2)
- 5 Pipe ring and vertical hanging system
- TR TRIMO panel system, panel width ≥ 120 mm

M 1:7.5

NOTES:

- Fire resistance test including determination of fire integrity and insulation was carried out according to the standards: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements and EN 1366-3:2022-05 - Fire resistance tests for service installations - Part 3: Penetration seals.
- Tested in partnership between Trimo and Nullifire. For more information see Nullifire Data sheets and Installation instructions.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration**.
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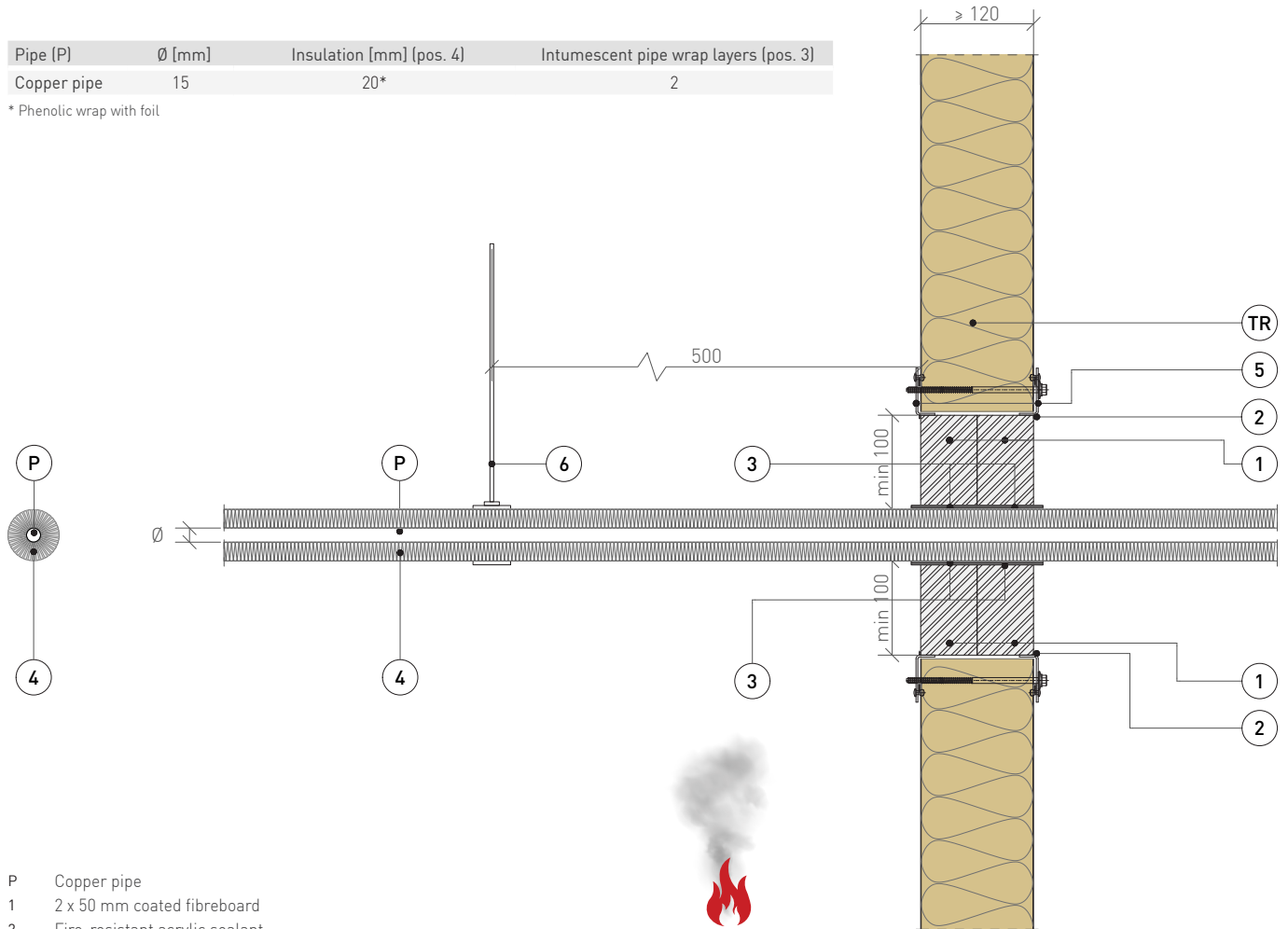
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D.2.3.2 Copper pipe penetration

E	120
I	120

Pipe (P)	Ø [mm]	Insulation [mm] (pos. 4)	Intumescent pipe wrap layers (pos. 3)
Copper pipe	15	20*	2

* Phenolic wrap with foil



- P Copper pipe
- 1 2 x 50 mm coated fibreboard
- 2 Fire-resistant acrylic sealant
- 3 Intumescent pipe wrap layers (2 Layer 2 rows)
- 4 20 mm phenolic pipe insulation with foil
- 5 2 mm galv. steel aperture framing capping channel (L-profile 50/20/2)
- 6 Pipe ring and vertical hanging system
- TR TRIMO panel system, panel width ≥ 120 mm

M 1:7.5

NOTES:

- Fire resistance test including determination of fire integrity and insulation was carried out according to the standards: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements and EN 1366-3:2022-05 - Fire resistance tests for service installations - Part 3: Penetration seals.
- Tested in partnership between Trimoterm and Nullifire. For more information see Nullifire Data sheets and Installation instructions.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration** [↗](#).
- Download Trimoterm FTV Fire-resistant internal wall system details [pdf ↓](#) or [dwg ↓](#)

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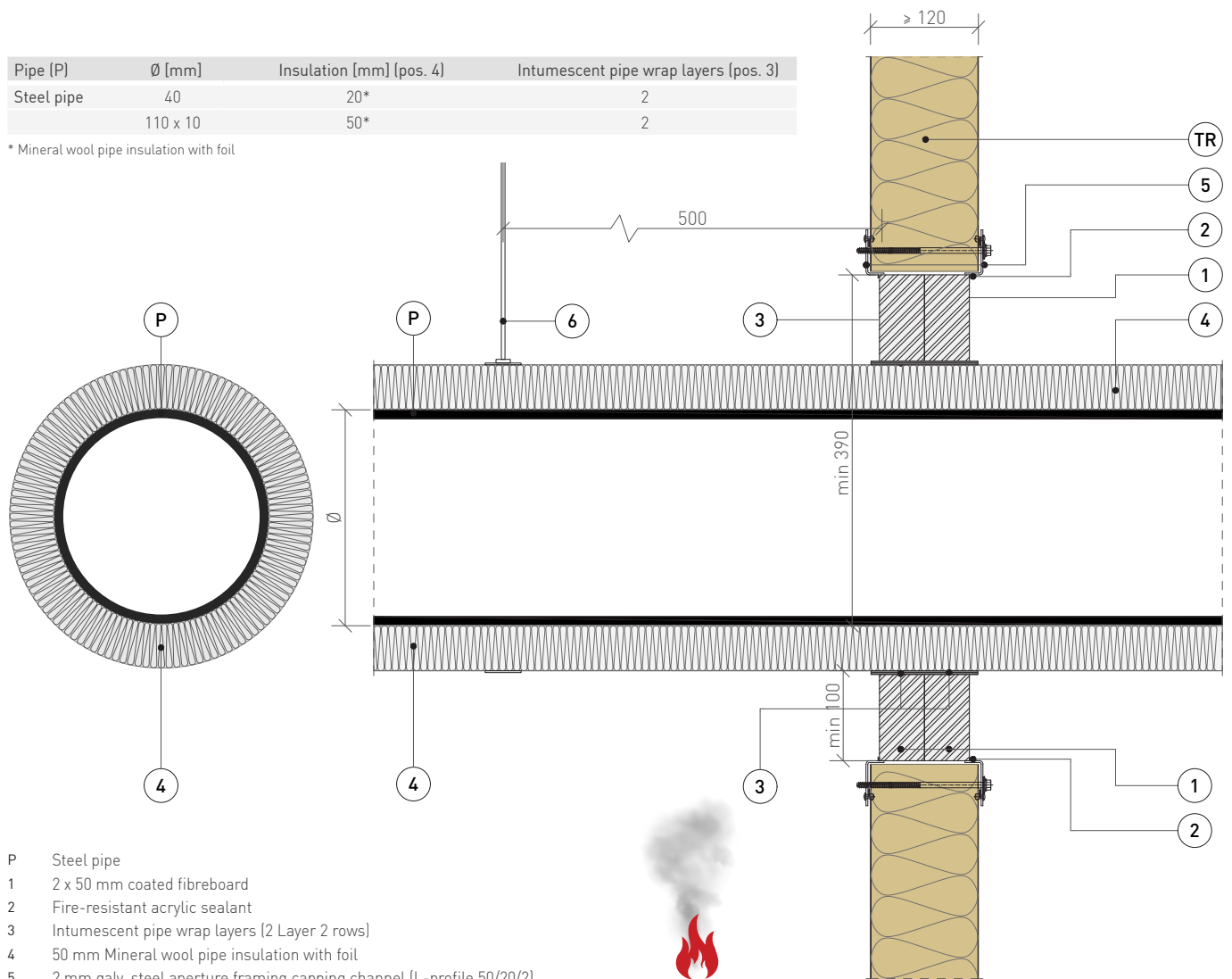
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D.2.3.3 Steel pipe penetration

E	120
I	120

Pipe (P)	Ø [mm]	Insulation [mm] (pos. 4)	Intumescent pipe wrap layers (pos. 3)
Steel pipe	40	20*	2
	110 x 10	50*	2

* Mineral wool pipe insulation with foil



- P Steel pipe
1 2 x 50 mm coated fibreboard
2 Fire-resistant acrylic sealant
3 Intumescent pipe wrap layers (2 Layer 2 rows)
4 50 mm Mineral wool pipe insulation with foil
5 2 mm galv. steel aperture framing capping channel (L-profile 50/20/2)
6 Pipe ring and vertical hanging system
TR TRIMO panel system, panel width ≥ 120 mm

M 1:7.5

NOTES:

- Fire resistance test including the determination of fire integrity and insulation was carried out according to the standards: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements and EN 1366-3:2022-05 - Fire resistance tests for service installations - Part 3: Penetration seals.
- Tested in partnership between Trimo and Nullifire. For more information see Nullifire Data sheets and Installation instructions.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration**.
- Download Trimoterm FTV Fire-resistant internal wall system details [pdf](#) or [dwg](#)

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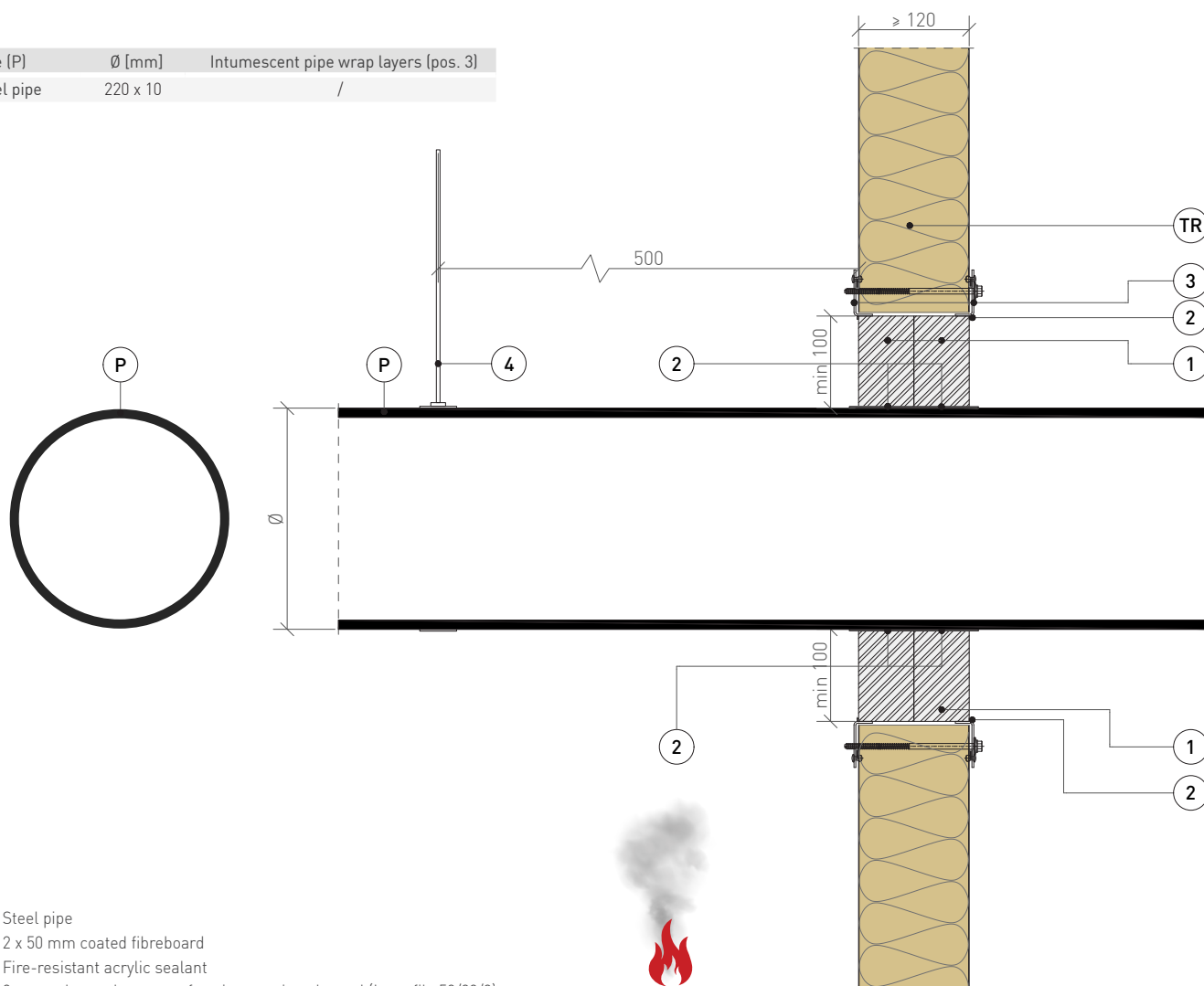
D

D.2.3.4 Steel pipe penetration (no intumescent pipe wrap layers)

E	120
I	120

Pipe (P)	Ø [mm]	Intumescent pipe wrap layers (pos. 3)
Steel pipe	220 x 10	/

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- P Steel pipe
 1 2 x 50 mm coated fibreboard
 2 Fire-resistant acrylic sealant
 3 2 mm galv. steel aperture framing capping channel (L-profile 50/20/2)
 4 Pipe ring and vertical hanging system
 TR TRIMO panel system, panel width ≥ 120 mm

M 1:7.5

NOTES:

- Fire resistance test including the determination of fire integrity and insulation was carried out according to the standards: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements and EN 1366-3:2022-05 - Fire resistance tests for service installations - Part 3: Penetration seals.
- Tested in partnership between Trimo and Nullifire. For more information see Nullifire Data sheets and Installation instructions.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration** [↗](#).
- Download Trimoterm FTV Fire-resistant internal wall system details [pdf ↓](#) or [dwg ↓](#)

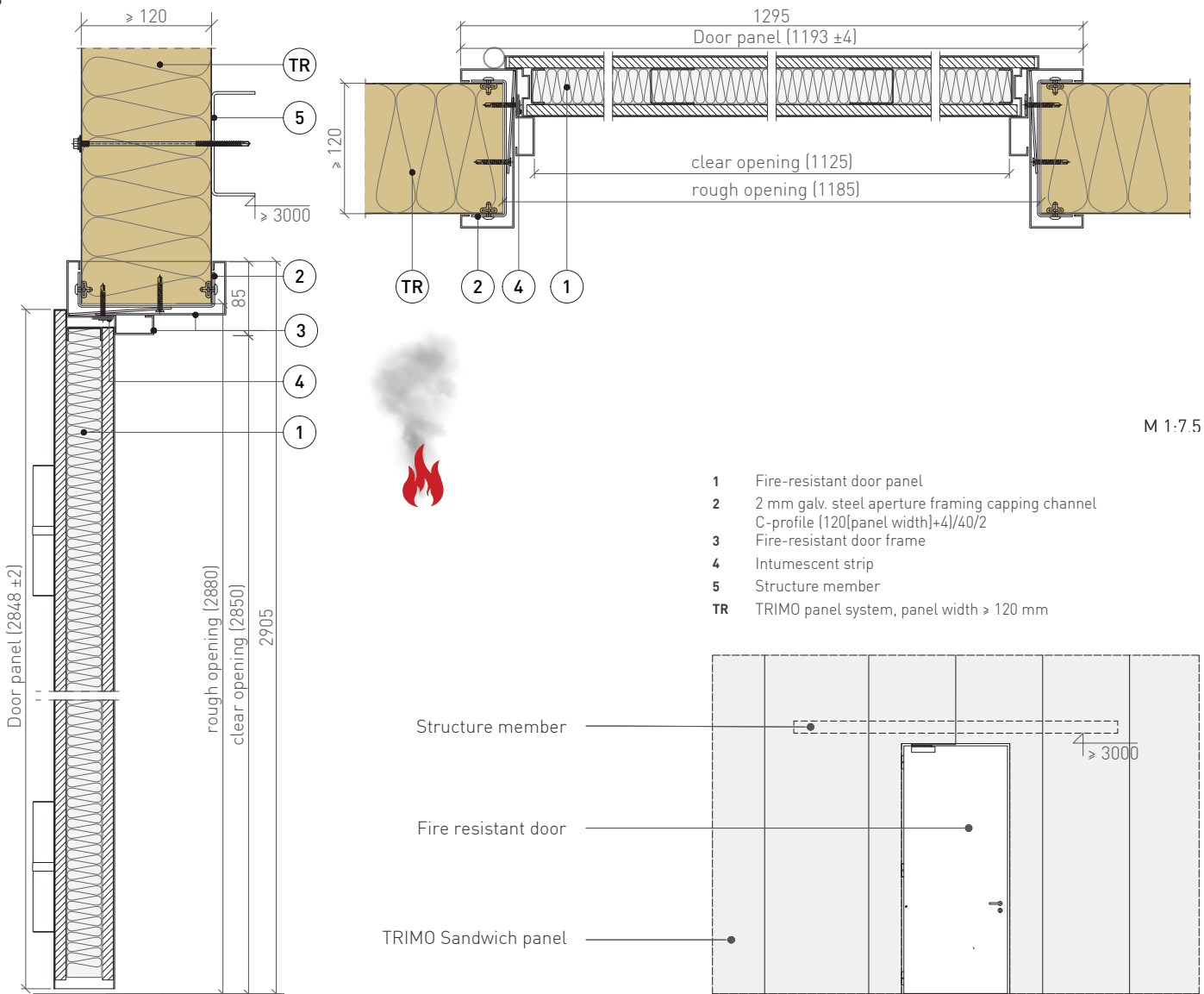
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D

D.3 Fire-resistant door

E	90,120*
I	60

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M 1:7.5

NOTES:

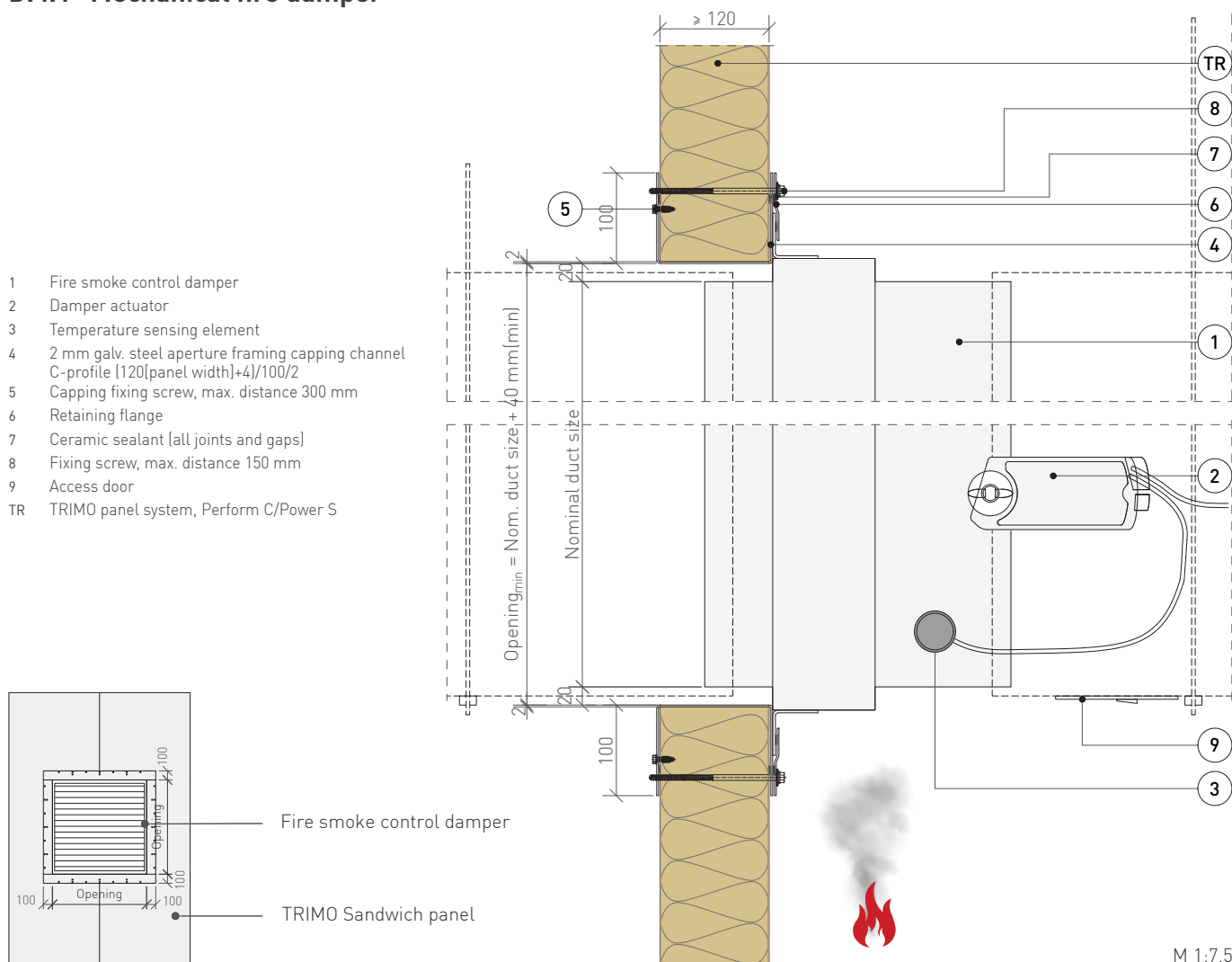
- Fire resistance test including the determination of fire integrity and insulation was carried out according to the standards: EN 1634-1:2016+A1:2018 Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 1: Fire resistance test for door and shutter assemblies and openable windows.
- E120 classification was achieved with Eurobond Doors installed in a Trimoterm FTV 150 mm fire-resistant sandwich panel construction.
- Tests were conducted in partnership between Trimo and Cimesa / Eurobond Doors. For more information on fire-resistant doors contact Cimesa or Eurobond Doors respectively.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration**.
- Download Trimoterm FTV Fire-resistant internal wall system details [pdf](#) or [dwg](#)

D

D.4 Fire dampers

D.4.1 Mechanical fire damper

E	90 (VE i↔o)S*
	120 (VE i↔o)



M 1:7,5

NOTES:

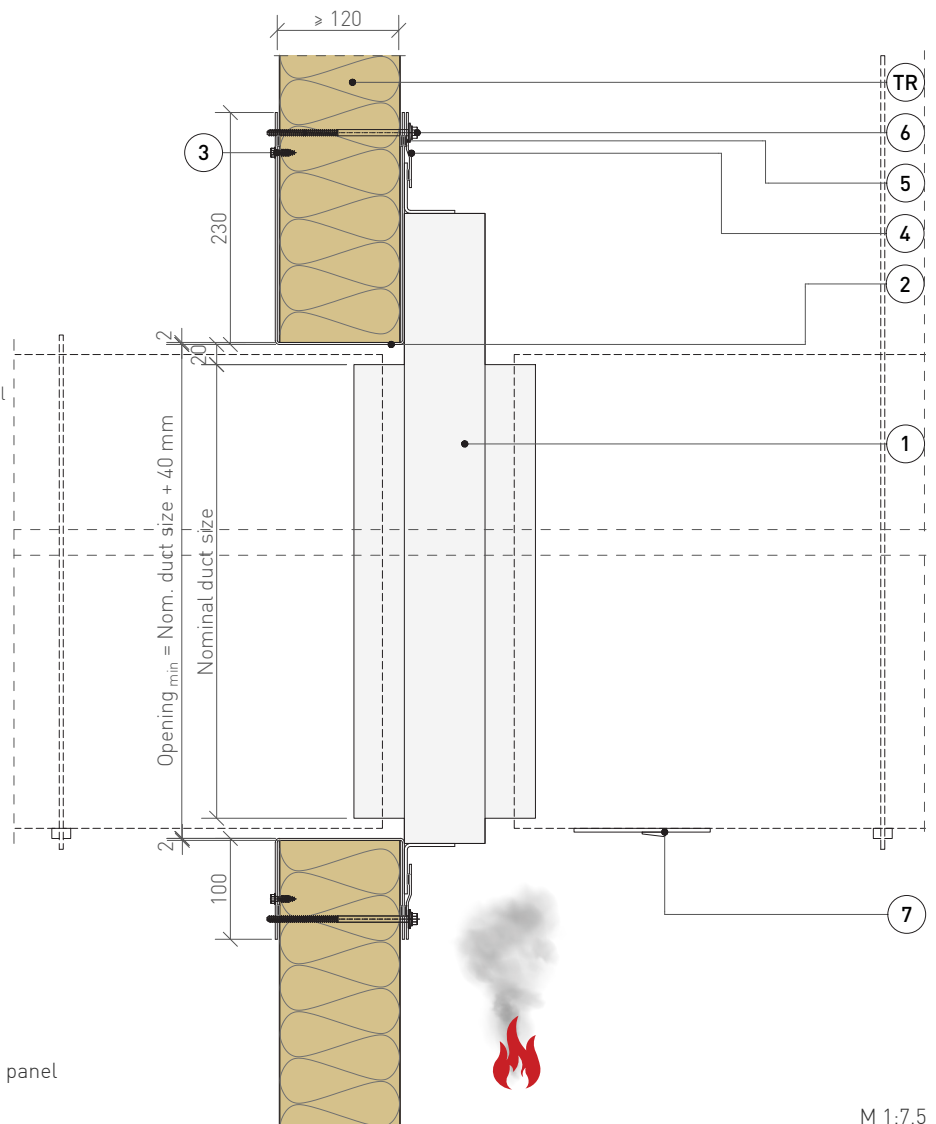
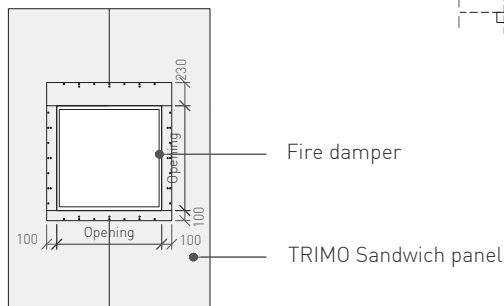
- Normative references: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements, EN 1366-2:2015 - Fire resistance tests for service installations - Part 2: Fire dampers, EN 13501-3:2005+A1:2009 - Fire classification of construction products and building elements - Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers.
- If a leakage classification (S) is not required, a test result obtained for the largest fire damper is applicable to all dampers of the same type (including any aspect ratio) provided that the maximum dimension do not exceed those tested and that the components remain in the same orientations as those tested. If leakage classification (S) is required, an additional fire damper, representing the smallest size, shall satisfy the leakage classification criteria when tested at ambient temperature.
- The test was carried out in partnership between Trimoterm and Advanced air Ltd. For more information on fire dampers and **installation** see AdvancedAir.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration**.
- Download Trimoterm FTV Fire-resistant internal wall system details [pdf](#) or [dwg](#)

D

D.4.2 Fire damper

E 120 (VE $i \leftrightarrow o$)

- | | |
|----|--|
| 1 | Fire damper |
| 2 | 2 mm galv. steel aperture framing capping channel
C-profile $[120[\text{panel width}]+4]/230/2$ or
C-profile $[120[\text{panel width}]+4]/100/2$ |
| 3 | Capping fixing screw, max. distance 300 mm |
| 4 | Retaining flange |
| 5 | Ceramic sealant (all joints and gaps) |
| 6 | Fixing screw, max. distance 150 mm |
| 7 | Access door |
| TR | TRIMO panel system, Perform C/Power S |



M 1:7,5

NOTES:

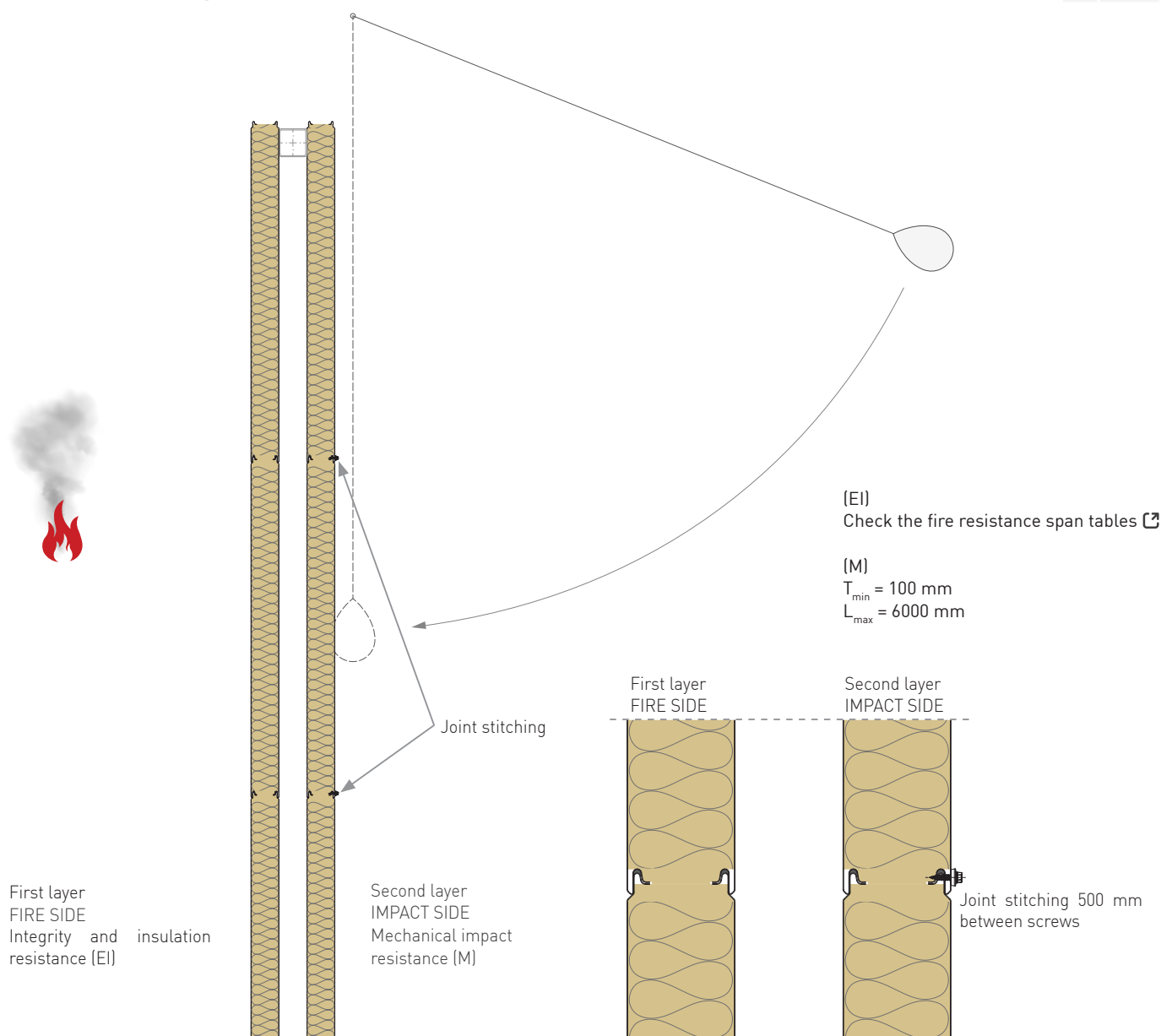
- Normative references: EN 1363-1:2020 - Fire resistance tests - Part 1: General requirements, EN 1366-2:2015 - Fire resistance tests for service installations - Part 2: Fire dampers, EN 13501-3:2005+A1:2009 - Fire classification of construction products and building elements - Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers.
- The test was carried out in partnership between Trimo and Advanced air Ltd. For more information on fire dampers and **installation** see AdvancedAir.
- For fire-rated panel stabilization, see chapter **D.1 Trimoterm panels with penetration** [↗](#).
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E

Fire-resistant mechanical impact

Double wall setup for fire resistance EI-M

EI 90-M

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NOTE:

- Normative references: EN 1363-2:2000 - Fire resistance tests - Part 2: Alternative and additional procedures and EN 13501-2:2023 - Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance and/or smoke control tests, excluding ventilation services
- The double wall system achieves fire resistance classified as EI-M. The principle behind this system is that one layer ensures integrity and insulation (EI) resistance, while the second layer provides mechanical impact (M) resistance. The second layer (Trimoterm FTV) is effective for all thicknesses starting from 100 mm and up, with a maximum panel length of 6.0 metres. Additionally, all joints in the second layer should be stitched with screws (at 500 mm).

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