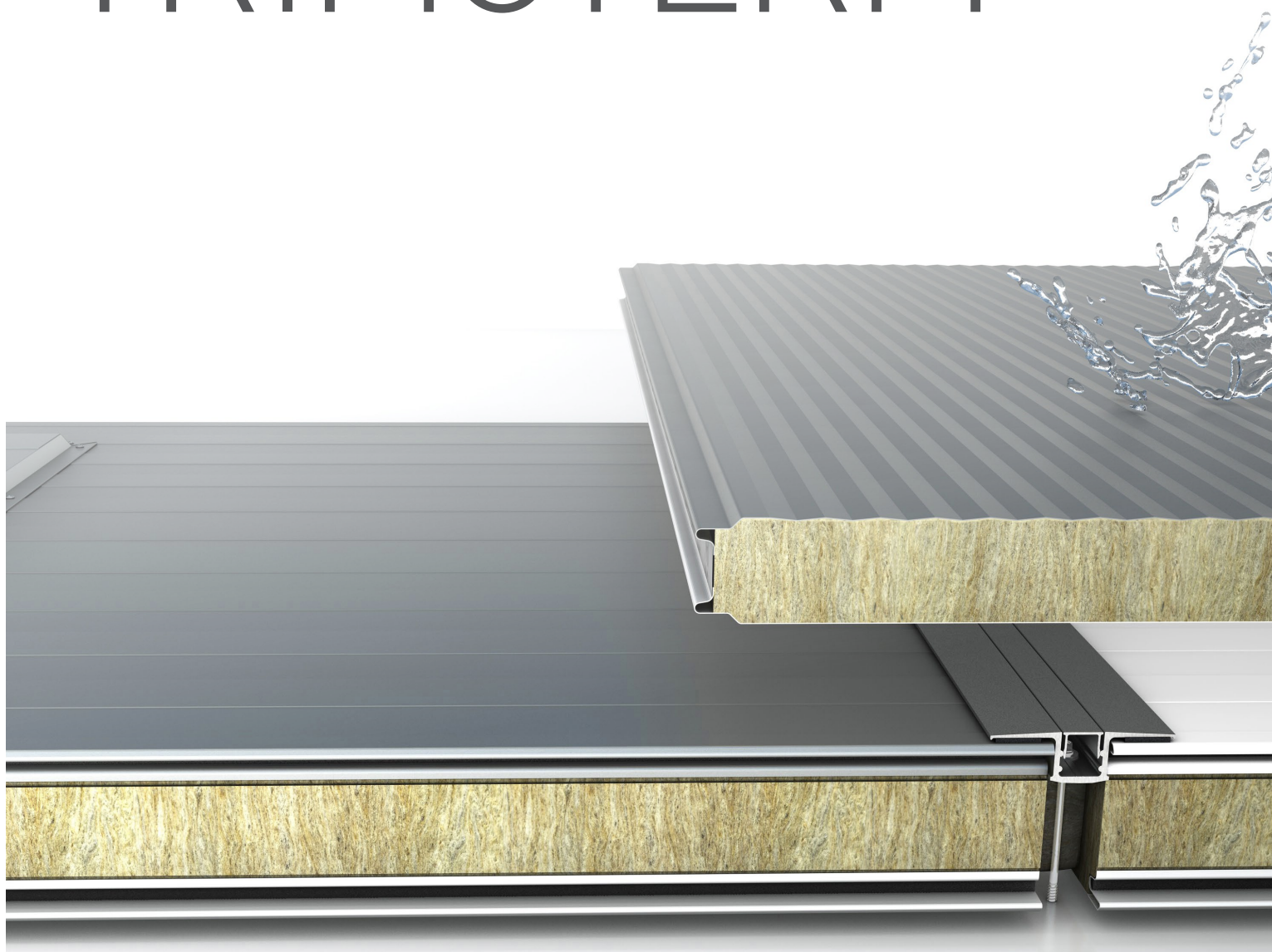


TRI MO TRIMOTERM



TRIMOTERM FTV

BOOK



Comprehensive technical book of Trimoterm FTV panels.

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 into its design.

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How to use this document?

The navigation tools in this document allow you to navigate and browse easily in several ways. You can find image explanations, links to download external documents, such as detailed technical guides and design data, go to specific headings and pages using the interactive table of contents and much more. Content dedicated to different project stakeholders is listed on page 5.

Find all the navigation options in the explanation boxes below.

Chapter navigation		
Product navigation		
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External document link		
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Additional notes		



Content for architects

- Panelised building history,
- Product portfolio,
- Trimoterm profile types,
- Technical data for Trimoterm panels,
- Colours,
- Trimoterm corner elements,
- Trimoterm curved panels,
- Trimoterm ArtMe solution,
- Trimoterm joint options,
- Decorative aluminium elements,
- Design tools and panel specification,
- Project consulting,
- References

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- Renovation principles,
- Product description,
- Technical data for Trimoterm panels,
- Performance of Trimoterm Sound panels,
- Protection against corrosion,
- Trimoterm system benefits,
- Trimoterm high build speed,
- Types of load-bearing structure for Trimoterm panels,
- How to read the calculations provided by Trimo,
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Content for installers

- Product description,
- Panel composition,
- Trimoterm panel tolerances,
- Trimoterm panel orientation,
- Installation direction,
- Panel fastening scheme and options,
- Installation of aluminium elements,
- Substructure tolerances,
- Fast adjustable levelling system,
- Trimoterm system sealing,
- Additional façade elements installation,
- Panel penetration recommendation,
- Project consulting,
- Other application documents



A Discover Trimoterm

A1 Panelised building history

Mineral wool sandwich panels are an example of a technology influenced by developments in many industries, including engineering, lightweight design from aerospace, and to meet the challenges of 20th Century architectural design. Here are the most recognised milestones of insulated panel development:

- 1849** Engineer William Fairbairn develops the concept of sandwich construction.
- 1928** The first preassembled metal house, the Dymaxion House by architect Buckminster Fuller.
- 1945** Metal finishing company Lincoln Industries Inc. launches the first housing application of metal sandwich panels for prefabricated homes.
- 1953** Jean and Henri Prouvé build a petrol station suitable for series production.
- 1959** US Materials company Koppers Inc. starts the first mass production of sandwich panels for building construction.
- 1961** Start of sandwich panel production by several manufacturers in Italy, Germany, Slovenia, Finland and Ireland.
- 1965** Engineer Giorgio Tognelli at Metecno in Italy creates the first continuous production line for insulated sandwich panels.
- 1987** Trimo starts the production of mineral wool (stone wool) insulated sandwich panels on a continuous line.
- 2010** Panel manufacturer Trimo launches ArtMe, a new decorative surface treatment for applying bespoke graphics.
- 2014** Publication of the EN 14509 harmonised standard for self-supporting double-skin metal-faced insulating panels – factory-made products.
- 2021** Approval by the United Nations of a set of common principles developed by the International Fire Safety Standards (IFSS) Coalition, which can be applied to buildings around the world.



A

A2 Product portfolio

As an architectural product, mineral wool core panels are used as a visually appealing and cost-effective solution for building. Applications such as cladding for insulated walls, partition walls, wall backing and roofs. They can be specified to provide weatherproofing, aesthetics, fire performance and thermal and acoustic insulation.

Trimoterm provides comprehensive details, including a wide range of versatile accessories such as fasteners for panels and flashings, sealants, aluminium profiles and flashings.

Panel core material (see page 16)

4 different types of mineral wool core with density of 90-120 kg/m³

- **Perform C**
- **Perform R**
- **Power T**
- **Power S**



Trimoterm SNV trapezoid profile



Trimoterm FTV HL joint (invisible fastening)



Trimoterm FTV joint (standard fastening)

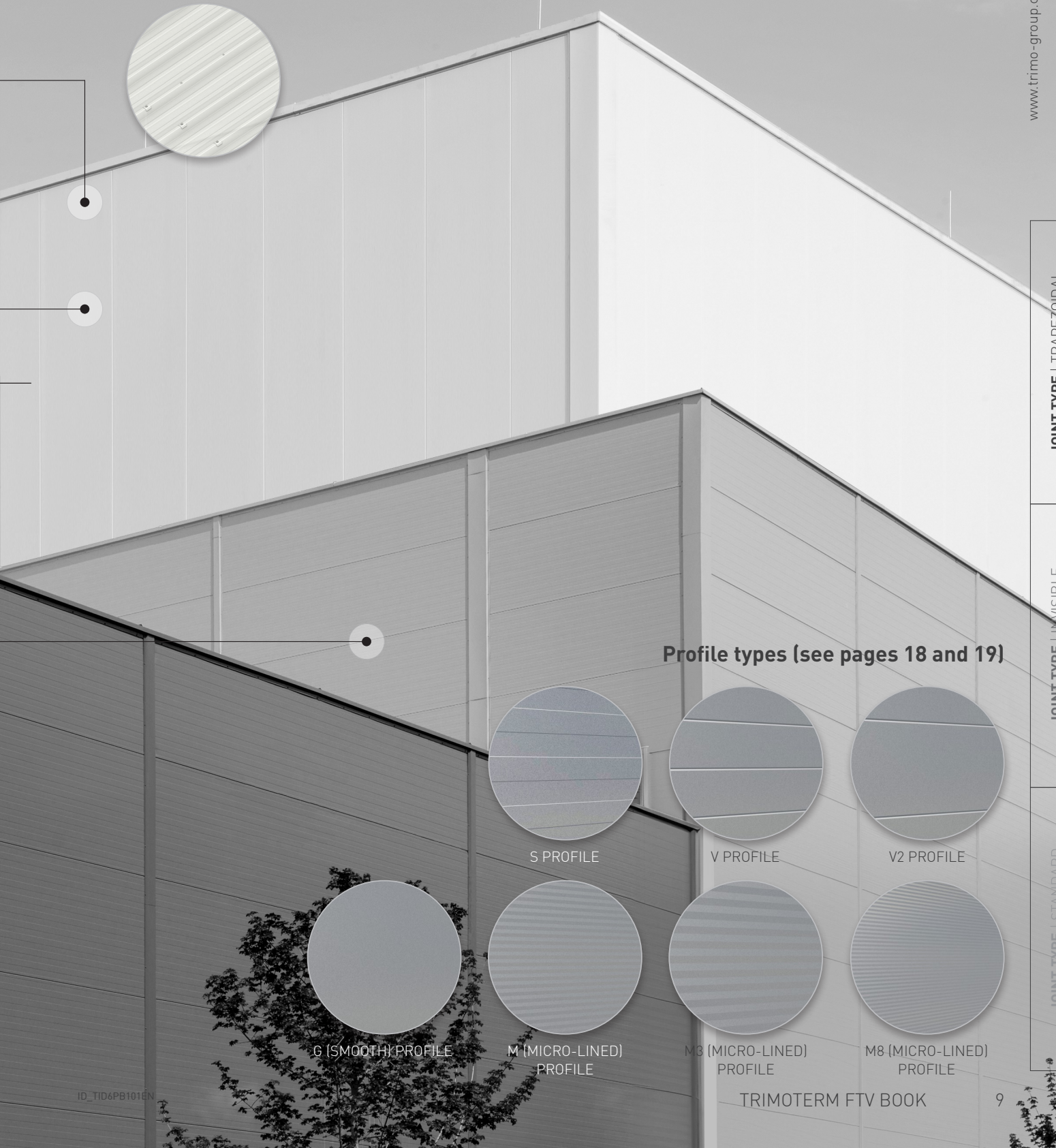
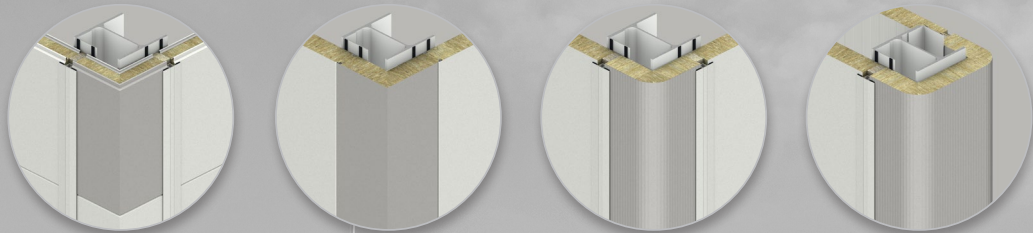
Trimoterm SNV roofs are a perfect solution for roofs with inclines. Due to its technical characteristics and a complete range of technical solutions and elements, Trimoterm roofing systems enable active adaptation to all the requirements of a building. The external facing has a trapezoid profile.

The hidden fastening system Trimoterm FTV HL mineral wool sandwich panels offer (with a multi-span system) a clean façade appearance with no visible fastenings. Trimoterm panels with hidden joints are mainly intended for vertical installation, but under certain conditions, they can also be used for horizontal installations.

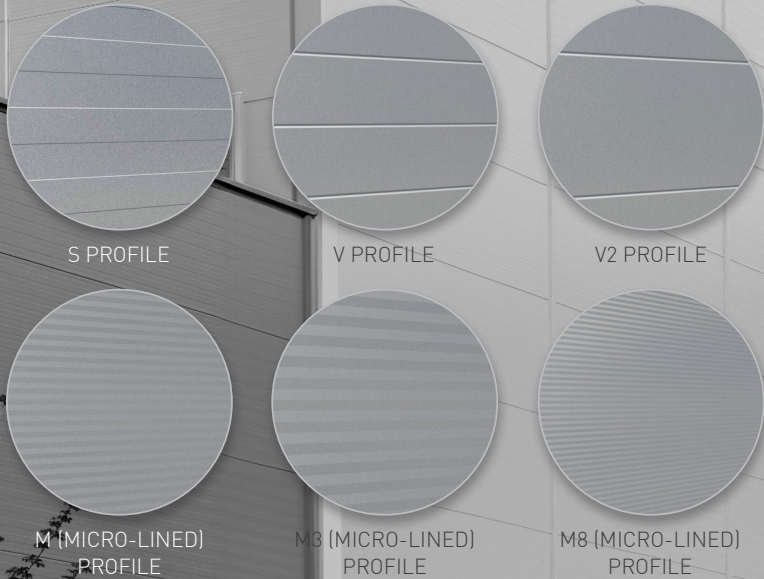
The standard fastening system for Trimoterm FTV mineral wool sandwich panels with a multi-span system represents a visible fixing method is suitable for the horizontal, vertical and segmental curved installation of panels.



Trimoterm special elements (see page 36)



Profile types (see pages 18 and 19)





A

A2.1 Trimoterm technology and workshop

All components of the mineral wool panels are sourced from Europe and shipped to the manufacturing facility in Trebnje, Slovenia. The manufacturing process involves steel de-coiling, roll forming, sheet alignment, mineral wool cutting, adhesive application, panel pressing, cutting and packaging.

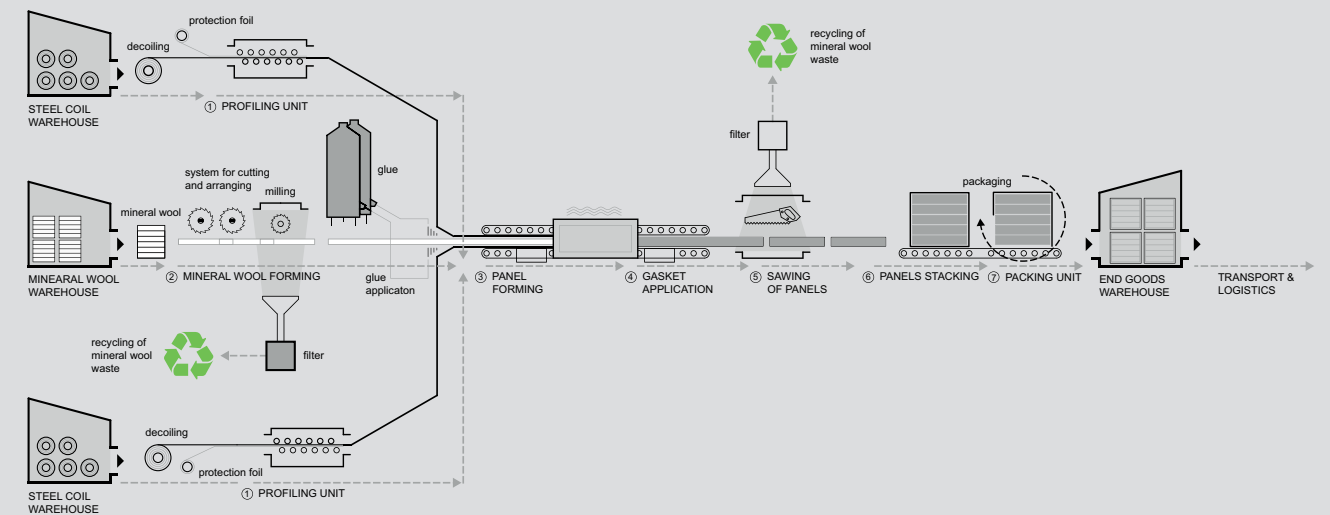


Fig. 1.0: Graphical representation of Trimoterm manufacturing process



A

A2.2 Trimoterm sustainability, a holistic approach

The sustainability performance of Trimo was assessed by Ecovadis for the first time in 2021 and afterwards as well. A silver rating has been achieved and the score shows that Trimo was among the top 15% of all rated companies (already more than 130.000 globally at the time of the preparation of this document). The results also show that Trimo is better than the industry average in all rated categories (Environment, Labour & Human Rights, Ethics and Sustainable Procurement).

Trimo is committed to sustainability and has set ambitious greenhouse gas emissions reduction targets in alignment with the Science-Based Targets initiative (SBTi). By integrating the latest climate science into its sustainability strategy, Trimo aims to significantly lower its carbon footprint and contribute to global efforts to limit temperature rise to well below 2°C, with a vision of 1.5°C. Trimo’s final goal is to have net-zero greenhouse gas emissions across the value chain by no later than 2050.

Company’s & product’s perspective

Sustainable products (reducing consumption of natural resources)

Trimo’s panels are a sustainable solution for building construction. They are produced with up to 45% recycled content and after the end of their use stage, up to 99% of them can be recycled. The panels also contribute to an excellent indoor environment as the measurements of VOCs (Volatile Organic Compounds) show full compliance with the European requirements.



A



A. Material reuse

Panels are designed for reuse or repurposing. This process has already been successfully implemented, and with effective planning, it can be applied to all existing and new Trimo panels.

B. Renovation

Panels are appropriate for building renovation as well. They can be used to replace old panels or they can be used as an “add-on” to an existing façade to renew its architectural design or improve its thermal and acoustical performance.

C. Reducing energy consumption

High airtightness and excellent thermal insulation, with a U-value as low as 0.15 W/m²K, significantly reduces energy consumption for heating and cooling, thereby minimising carbon emissions in the use phase of the building.

D. Reducing embodied carbon in carbon-neutral buildings

At Trimo, we are dedicated to minimising the environmental impact of our products, particularly in reducing the embodied carbon of our panels. We are investing significant resources and efforts into innovative design, sustainable materials and optimising manufacturing processes. In line with our commitment to transparency and sustainability, Environmental Product Declarations (EPDs) have been issued for all our product groups, providing detailed insights into their environmental performance throughout their lifecycle.

E. Complete customer support in carbon-neutral buildings

With our products, you can achieve the highest ratings in sustainability certifications such as BREEAM, LEED and DGNB. We are dedicated to providing full customer support in the development of carbon-neutral buildings, ensuring that your projects meet the highest environmental standards while contributing to a sustainable future.



B Panel product sheet

B1 Product description

Trimoterm mineral wool panels are used for a wide range of external façade cladding, internal partition walls, fire walls and ceilings for leisure, commercial, industrial, hygienic and other facilities. It offers the perfect combination of functionality and durability, while also supporting true architectural expression.

Due to their non-combustible core, excellent thermal and sound insulation, as well as excellent hygienic characteristics, Trimoterm prefabricated wall panels can also be successfully used in the most demanding environments, such as in the energy production and food-processing sectors and the pharmaceutical industry. The Trimoterm FTV standard joint system represents the basic fixing method of Trimoterm panels and is suitable for the horizontal, vertical and segmental curved installation of panels.



www.trimo-group.com/en/products/facades-and-walls/trimoterm

B1.1 Key features of insulated sandwich panels

- Self-supporting (up to 10 m single span),
- Manufactured up to 14 m multi-span,
- Single factory-manufactured unit,
- Water & air tightness,
- Extreme thermal values,
- Moisture resistant,
- 98% recyclable

B1.2 Benefits of mineral wool insulated panels

- Single factory-manufactured unit,
- A sustainable choice,
- Safety and performance,
- Design flexibility,
- Lightweight factory system,
- Low life cycle costs,
- First-class service

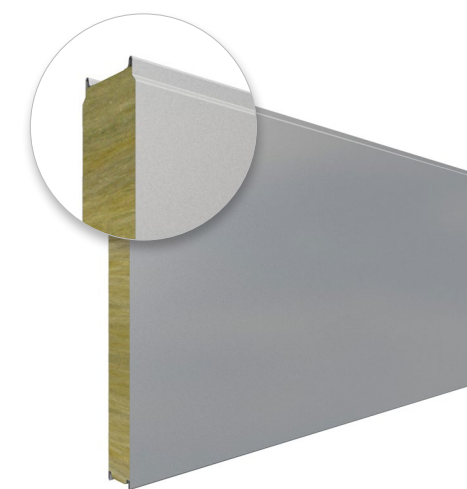


Fig. 1.1: Trimoterm FTV panel



B

B2 Panel composition

Trimoterm FTV mineral wool sandwich panels consist of two profiled, coated sheet faces in thicknesses of 0.45 mm to 0.80 mm. The steel sheet is bonded to the panel core, which is made of non-combustible mineral wool lamellas of class A1 (EN 13501-1). Two-component polyurethane adhesive is used to glue the faces to the core. All three layers make a solid Trimoterm FTV panel.

The panel outline edges are formed by a longitudinal and a cut joint. The longitudinal joint is formed with a tongue and groove while the cut joint is recognised by the straight panel cut edge.

B2.2 Mineral wool

Stone wool is an insulation material made of melted stone of volcanic origin that is then fiberised. It is recyclable, non-combustible and available in four types with densities ranging from 90-120 kg/m³ for use in Trimoterm panels:

Perform C

Robust and compact mineral wool core type,

Perform R

Regular mineral wool core type,

Power T

Mineral wool core type with high thermal insulation properties,

Power S

Mineral wool core type with higher structural spanning capabilities.

L - Length (mm)
M - Module width (mm)
T - Panel thickness

* For the French or German markets, consult Trimoterm's technical support to comply with the regional legislation.
** For shorter panels, check with Trimoterm technical support.
*** Please check the availability of the product.



B

B2.1 Product dimensions

Internal steel sheet

The steel sheet consists of several layers (galvanisation, primer, coating and protective foil), enabling protection against corrosion and contamination.

Profilation: see page 19
Thickness: 0.45-0.80 mm (see page 18)
Colour: see page 38
Coating: see page 37

External steel sheet

Steel sheet can be corrugated, slatted, micro-ribbed or smooth. It consists of several layers enabling protection against corrosion and contamination.

Profilation: see page 19
Thickness: 0.45-0.80 mm (see page 18)
Colour: see page 38
Coating: see page 37

Mineral wool core

Select a suitable core based on thermal and structural requirements. See chapter B4.1.

Surface protection

A protective foil is applied to the panel surface to help prevent damage during installation.

The application of the protective foil depends on the chosen packing type.

Longitudinal joint

The longitudinal joint is formed by the tongue and groove in order to, when interlocked with adjacent panel sidelaps, prevent water and other liquids seeping into the core insulation.

Factory-applied gaskets

Cross-section A - A

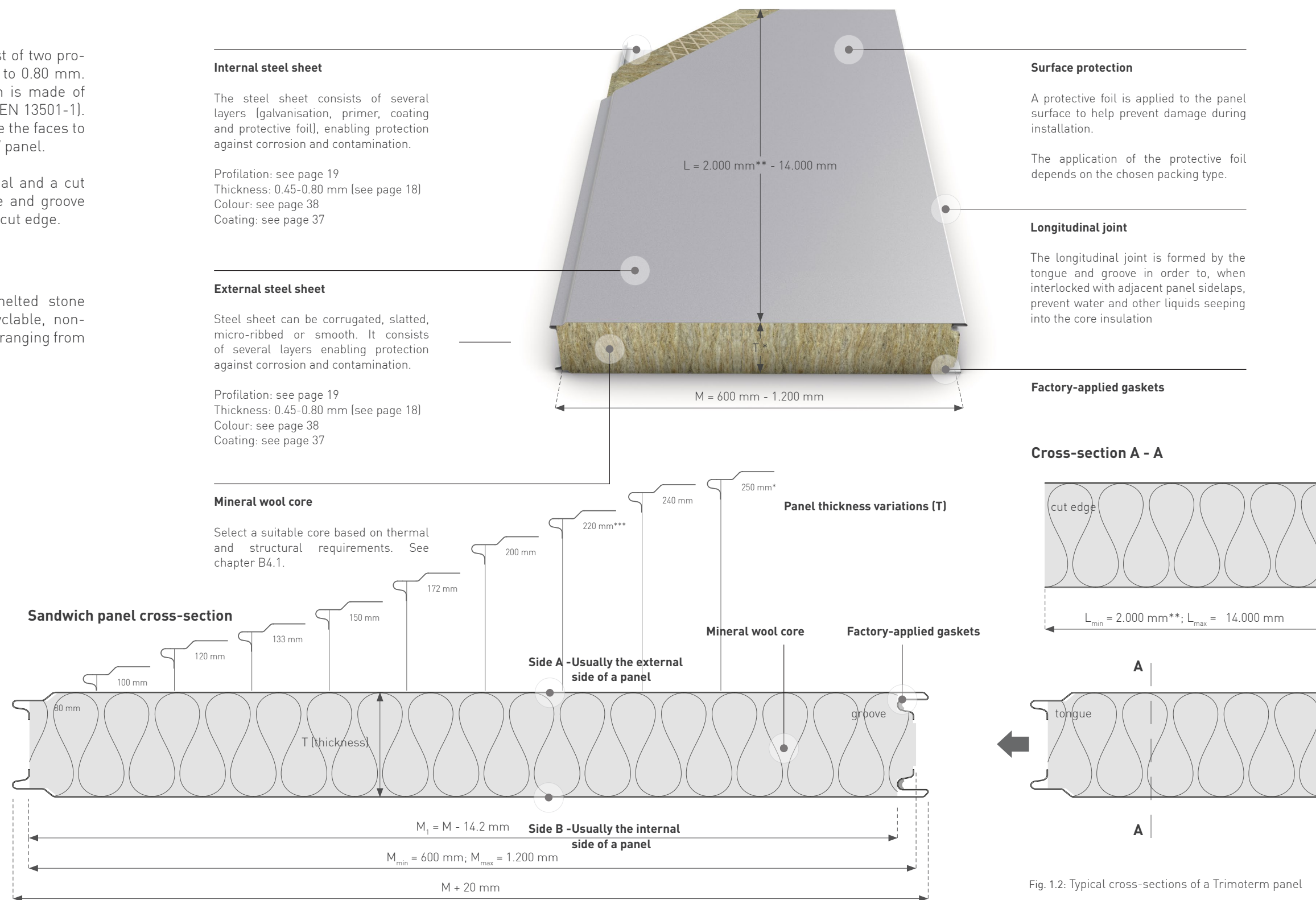


Fig. 1.2: Typical cross-sections of a Trimoterm panel



B

B2.3 Steel sheet thickness and profile

Trimoterm FTV mineral wool sandwich panels are distinguished by a wide range of profiles that enable the design of a large number of different solutions, tailored to individual buildings.

The steel sheet of the sandwich panels is manufactured using an advanced profiling tool. The panel order must specify the profile for both internal and external steel sheet surfaces.

Internal and external steel sheet thicknesses available:

- 0.45 mm,
- 0.50 mm,
- 0.55 mm,
- 0.60 mm,
- 0.63 mm,
- 0.65 mm,
- 0.675 mm,
- 0.70 mm,
- 0.75 mm,
- 0.80 mm

Steel sheet thickness for profiles V2 and V6 is 0.7 mm.
For the G profile, we recommend using a steel sheet with a thickness of 0.7 mm.

The full range is available at:



Trimoterm technical specifications

Trimoterm FTV profile type	A	B
S (standard) profile	•	•
V profile (V, V2, V6*)	•	•
G (smooth) profile	•	•
Micro-lined profile (M, M3)	•	
Micro-lined profile (M2)		•
Micro-lined profile (M8)	•	

* Available with 1.200 mm module width only.

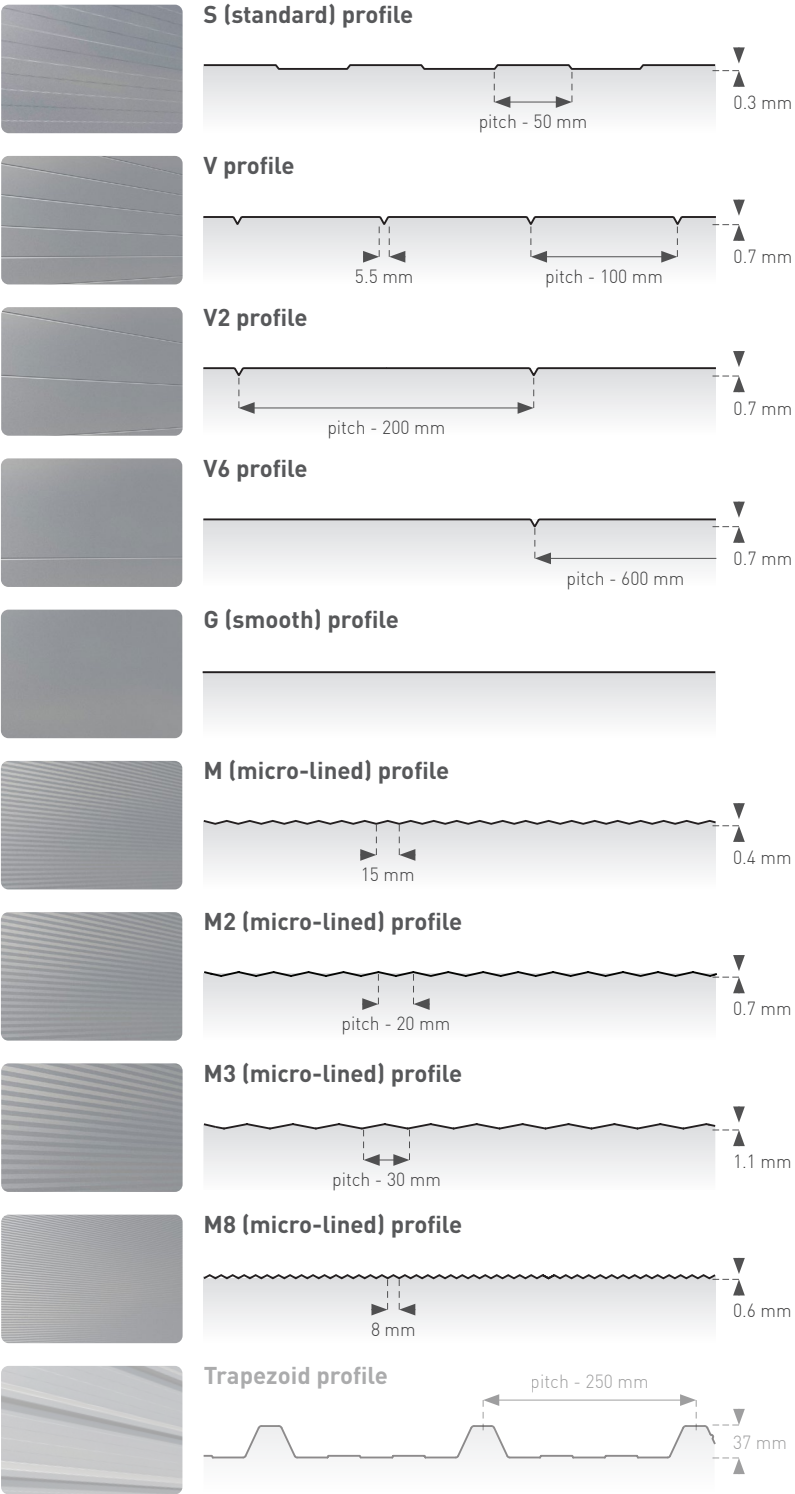
Trimoterm FTV HL profile type	A	B
S (standard) profile	•	•
V profile (V, V2)	•	•
G (smooth) profile	•	•
Micro-lined profile (M, M3)	•	
Micro-lined profile (M2)		•
Micro-lined profile (M8)	•	

Trimoterm SNV profile type	A	B
Trapezoid	•	
S (standard) profile		•
V profile (V, V2)		•
G (smooth) profile		•
Micro-lined profile (M2)		•



B

Profile types



! NOTES & WARNINGS

The arrangement of the V profile (and all others) typically starts on the middle (centre) of the panel steel sheet prior to the forming stage. The module end, groove and the distance from the panel edge depend on the Trimoterm panel module and may vary. Any other V profile arrangements are declared as non-standard and subject to individual order. The arrangement of the S profile typically starts on the middle (centre) of the panel steel sheet prior to the forming stage. The module end and the distance from the panel edge depend on the Trimoterm panel module and may vary.

Some combinations are mutually exclusive depending on the type of profile and product. For the approval of the requested profile combination, please contact Trimoterm's technical support team.



B

B2.4 Panel tolerances

Tolerance is the upper and lower acceptable limit for measurements. It can be applied to every measurable aspect of a manufacturing element. Tolerances for rectangular Trimoterm FTV panels are in accordance with EN14509 standard.

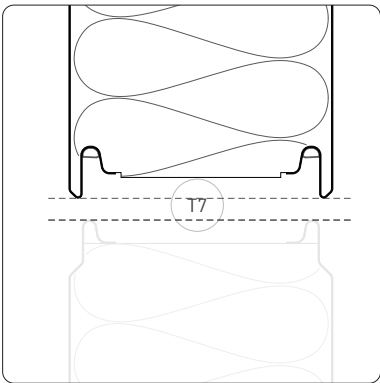
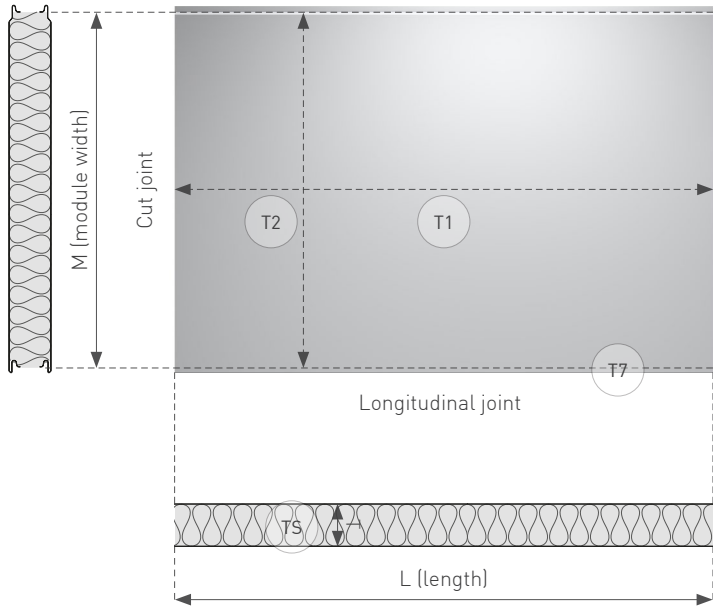


Fig. 1.3: Panel end shift

Name	Dimension	Tolerance	Value (mm)	Remarks
Panel thickness	T	TS	T ≤ 100 mm ... ± 2mm T > 100 mm ... ± 2%	Tolerance of element thickness
Panel length < 3 m	L	T1	L ≤ 3 m ... ± 5 mm L > 3 m ... ± 10 mm	Tolerance of external steel sheet length
Panel width	M	T2	± 2	Tolerance of the external steel sheet module width
Panel flatness (longitudinal)			0.6 mm 1.0 mm 1.5 mm	Flatness deviation of the external steel sheet surface in the longitudinal direction. Measurement length: L = 200 mm L = 400 mm L = 700 mm
Panel end shift (transversal)		T7	± 2	Deviation of internal / external steel sheet position

Tab. 1.0: Trimoterm FTV panel tolerances



B

B3 Technical data

• B3.1 Technical data for the Trimoterm FTV mineral wool façade panel

Explore the indicative values for Trimoterm sandwich panels in façade application. For more product values and product availability, see the Trimo technical specifications document.

Panel thickness (mm)	50	60	80	100	120	133	150	172	200	220	240 ⁽⁵⁾	250 ⁽¹⁾
CORE: POWER T												
Weight (Fe 0.55/0.5) (kg/m²)	-	15.3	17.1	18.9	20.7	21.9	23.4	25.4	27.9	29.7	31.5	32.4
Max. achievable fire resistance (EN 14509) ⁽²⁾	-	-	-	up to EI90	up to EI120	up to EI120	up to EI180	up to EI180	up to EI180	up to EI180	up to EI180	up to EI180
U - Thermal transmittance (W/m² K) ⁽³⁾	-	0.6	0.46	0.37	0.31	0.28	0.25	0.22	0.19	0.17	0.16	0.15
Airborne sound insulation: R _w [C;C _{tr}] dB (EN 14509) ⁽⁴⁾	-	30 [-2;-4]	30 [-2;-4]	31 [-3;-4]	31 [-3;-4]	31 [-3;-4]	31 [-3;-4]	31 [-3;-4]	31 [-3;-4]	31 [-3;-4]	31 [-3;-4]	31 [-3;-4]
Combustibility of the material core (EN 13501-1)	-	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1
Water permeability (EN 14509)	-	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)
Air permeability [C (m³/Pa s);n]	-	C=0.00005 m³ (Pa s); n=1.5										
CORE: POWER S												
Weight (Fe 0.55/0.5) (kg/m²)	15.8	17.0	19.4	21.8	24.2	25.8	27.8	30.5	33.8	-	38.6	-
Max. achievable fire resistance (EN 14509) ⁽²⁾	-	up to EI30	up to EI60	up to EI120	up to EI120	up to EI120	up to EI180	up to EI180	up to EI180	-	up to EI180	-
U - Thermal transmittance (W/m² K) ⁽³⁾	0.77	0.65	0.50	0.41	0.34	0.31	0.28	0.24	0.21	-	0.17	-
Airborne sound insulation: R _w [C;C _{tr}] dB (EN 14509) ⁽⁴⁾	-	31 [-2;-3]	31 [-2;-3]	32 [-2;-4]	32 [-2;-4]	32 [-2;-4]	32 [-2;-4]	32 [-2;-4]	32 [-2;-4]	-	32 [-2;-4]	-
Combustibility of the material core (EN 13501-1)	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	-	Class A1	-
Water permeability (EN 14509)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	-	Class A (1200Pa)	-
Air permeability [C (m³/Pa s);n]	C=0.00005 m³ (Pa s); n=1.5										-	-
CORE: PERFORM C												
Weight (Fe 0.55/0.5) (kg/m²)	15.8	17.0	19.4	21.8	24.2	25.8	27.8	30.5	33.8	-	38.6	-
Max. achievable fire resistance (EN 14509) ⁽²⁾	-	up to EI30	up to EI60	up to EI120	up to EI120	up to EI120	up to EI180	up to EI180	up to EI240	-	up to EI240	-
U - Thermal transmittance (W/m² K) ⁽³⁾	0.75	0.64	0.49	0.40	0.33	0.30	0.27	0.24	0.20	-	0.17	-
Airborne sound insulation: R _w [C;C _{tr}] dB (EN 14509) ⁽⁴⁾	-	31 [-2;-3]	31 [-2;-3]	32 [-2;-4]	32 [-2;-4]	32 [-2;-4]	32 [-2;-4]	32 [-2;-4]	32 [-2;-4]	-	32 [-2;-4]	-
Combustibility of the material core (EN 13501-1)	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	Class A1	-	Class A1	-
Water permeability (EN 14509)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	Class A (1200Pa)	-	Class A (1200Pa)	-
Air permeability [C (m³/Pa s);n]	C=0.00005 m³ (Pa s); n=1.5										-	-

(1) For the French or German markets, consult Trimo’s technical support to comply with the regional legislation.
(2) A request for fire resistance must be clearly specified by customer.
(3) Values valid for featured application in the centre of panel.
(4) According to EN ISO 140-3 and EN ISO 354.
(5) Please check for the availability of the product.

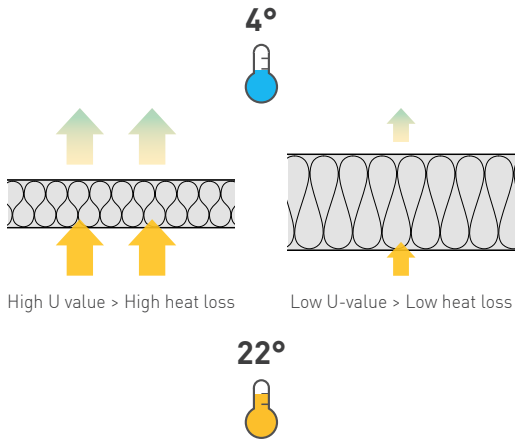


B

B3.2 Thermal transmittance

One of the most important parameters when it comes to heat losses in buildings is the thermal transmittance or U-value. When we talk about sandwich panels, we’re describing how well the component transmits heat from the inside (usually) to the outside.

The higher the U-value, the more heat flows through an object within a certain time and the lower the insulation. Low U-values therefore mean good thermal insulation properties.



Thermal conductivity

Thermal conductivity or lambda (λ) is a material property that describes how well a material conducts heat. It is defined as the amount of heat (in watts) that passes through a material with a thickness of 1 metre and a surface area of 1 square metre when the temperature difference between the two sides is 1 degree Celsius (or 1 Kelvin).

In the context of the sandwich panels, the core material’s thermal conductivity plays a crucial role in determining the overall U-value of the panel. The lower the thermal conductivity of the core, the better the panel insulates.

- Power T** λ = 0.039 W/mK
- Perform C** λ = 0.042 W/mK
- Power S** λ = 0.043 W/mK

100%

Customised product

Whether your applications involve industrial buildings, logistics centres, shopping malls or steel structures, including roofs, façades, partition walls or other elements, we can customise the mechanical performance to meet your specific requirements.



B

B3.3 Sound

Sound insulation in buildings is of great importance for wellbeing and health. Acoustic performance can be divided into two important phenomena. These are sound insulation and sound absorption. Here is the full list of sound-related properties:

- Airborne sound insulation
- Sound absorption
- Sound transmission through the construction
- Sound reflection from element surface
- Structure-borne sound transmission

Sound insulation

Sound insulation refers to the process of reducing the transmission of sound between different areas. This can be achieved through various materials and construction techniques that absorb, dampen or block sound waves. All Trimoterm panels are used as effective sound insulation materials.

Sound absorption

Sound absorption refers to the process of reducing sound within the enclosed area. This is achieved by a material, structure or object that takes in sound energy when sound waves encounter it, as opposed to reflecting the sound. Trimoterm Sound panels with a perforated face are used as an effective sound absorption solution.

Class A: $\alpha_w \geq 0.90$

Class B: $0.80 \leq \alpha_w < 0.90$

The coefficient α_w ranges from 0-1 (1 indicates total absorption with no reflection).

Terms

The decibel (abbreviation dB) is a logarithmic value for the measurement of sound pressure level. It is a unit without any dimension that expresses a relationship between an acceptable quantity and a fixed reference.

A weighted sound reduction index (R_w) is a number used to rate the effectiveness of a soundproofing system such as walls, ceilings or roofs. The value R_w is supplemented by the following data C and C_{tr} :

- The sum of $R_w + C$ stands for sound insulation for low frequencies in dB.
- The sum of $R_w + C_{tr}$ stands for sound insulation for traffic frequencies in dBA.

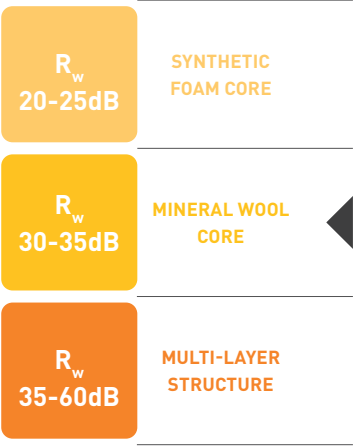


Fig. 1.5: Sound insulation range for different panel cores

B

Airborne sound transmission

Airborne sound is the most common type of sound transmission and it occurs when sound waves travel through the air from a sound source to a receiver.

When airborne sound encounters a building element such as a wall, part of the sound energy is transmitted through the material, while another part is reflected or absorbed. The transmitted sound can then be heard on the other side of the wall in a different space.

The STC or sound transmission class is a single-number method of rating how well wall partitions reduce sound transmission.

Sound reflection from a surface

When sound waves strike a surface, some of the energy is absorbed and some is reflected back into the space. The way that sound reflects off of surfaces in a room can have a significant impact on how sound is perceived by those within the space.

Structure-borne sound transmission

Impact sound transmission happens when an object or surface is struck or impacted, transmitting vibrations through the building's fabric.

These vibrations can travel through walls, floors and ceilings and can be heard as noise in adjacent areas. Impact sound insulation measures focus on minimising the transmission of vibrations through the structure.

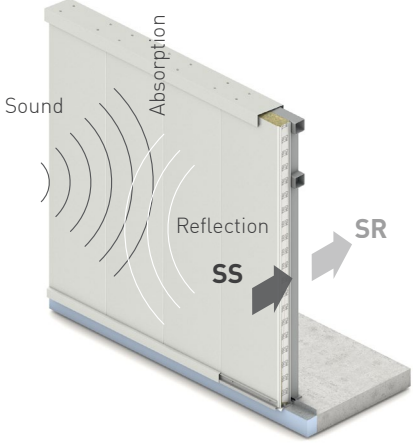


Fig. 1.5: Trimoterm wall sound related properties

STC	What can be heard
25	Normal speech can be understood.
30	Loud speech can be understood.
35	Loud speech is audible but not intelligible.
40	Loud speech is audible as a murmur.
45	Loud speech is heard but not audible.
50	Loud sounds are faintly heard.
60+	Good soundproofing, most sounds do not disturb neighbouring residents.

Fig. 1.6: Sound transmission classes

SS - Sound source
SR - Sound reception





B

Performance of Trimoterm Sound panels

In addition to the excellent fire protection and thermal insulation properties, Trimoterm Sound panels have good sound insulation and absorption. For the Trimoterm Sound panel acoustic ratings, see the Trimoterm technical specifications document.

The default configuration of the Trimoterm Sound panel includes a perforated steel sheet on side B (internal) with an RV 4x8 pattern. This side is lined with polyester felt, followed by a mineral wool core (Power T) and a profiled steel sheet on side A (external). All elements are bonded together using a specialized adhesive. The integrated protective felt serves a dual purpose: it prevents dust from entering the panel core and stops mineral wool particles from escaping into the environment.

The Trimoterm Sound panel is available in a modular width of 1.000 mm. It offers the following steel sheet profile combinations:

- **Side A** (external): S (standard), M (micro-lined), V, G (smooth)
- **Side B** (internal): S (standard), V (V - profile)

Ensure that Side B is oriented on the correct side so that the acoustic performance of the panel is fully utilized.

The response of Trimoterm Sound panels to fire has been tested in compliance with the standard SIST EN 13823. In compliance with the standard SIST EN 13501-1, Trimoterm Sound panels achieve a classification relating to the response to fire of B-s1,d0.

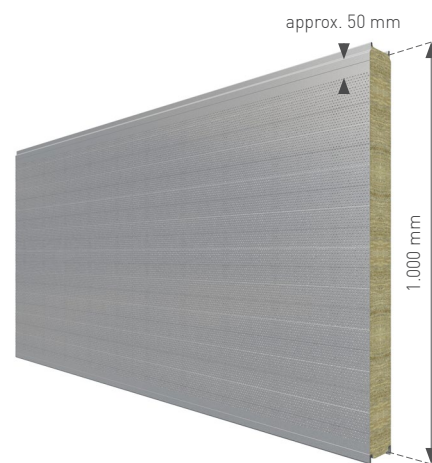


Fig. 1.7: Trimoterm FTV Sound panel side B.

! NOTES & WARNINGS

Tables of permissible distances for Trimoterm panels are not valid for Trimoterm Sound panels. Sound panels cannot be used for external applications on heated facilities in the EU climate zone (check the building physics calculation).

Penetrations through Trimoterm Sound panels significantly influence the structural performance of the panel and therefore must be a subject of an individual static calculation.

Real cases and non-standard applications need to be discussed individually with Trimoterm technical support.



B

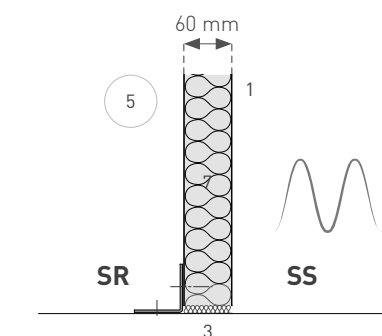
Trimoterm single- and multi-layer panel system sound performance

The number of panels in a wall system, the presence of a perforated panel steel sheet surface and the additional layer of material play crucial roles in influencing the sound absorption and insulation properties, allowing for tailored acoustic solutions.

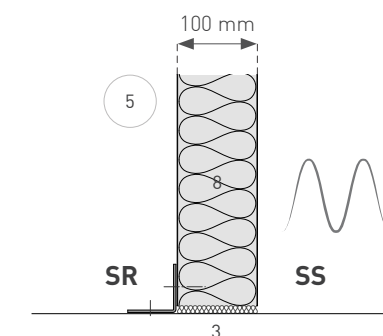
Explore examples of tested wall compositions:

1. Single Trimoterm FTV panel wall:

$R_w = 30 \text{ dB}$

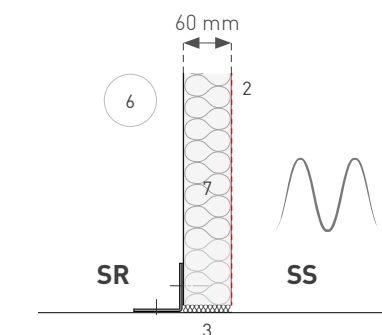


$R_w = 32 \text{ dB}$

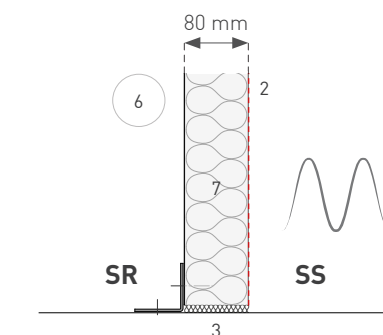


2. Single Trimoterm Sound panel wall:

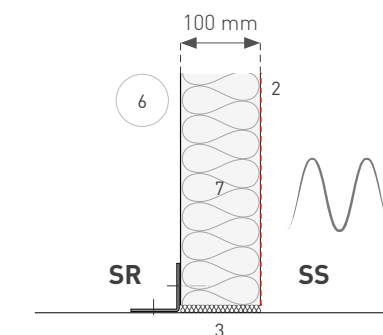
$R_w = 32 \text{ dB}$



$R_w = 33 \text{ dB}$



$R_w = 34 \text{ dB}$



1. Steel sheet,
 2. Perforated steel sheet,
 3. Mineral stone wool,
 4. Gypsum board,
 5. Trimoterm FTV,
 6. Trimoterm Sound,
 7. Power T mineral wool core,
 8. Power S mineral wool core
- SS - Sound source
SR - Sound reception



B

3. Single Trimoterm FTV panel wall + gypsum board wall:

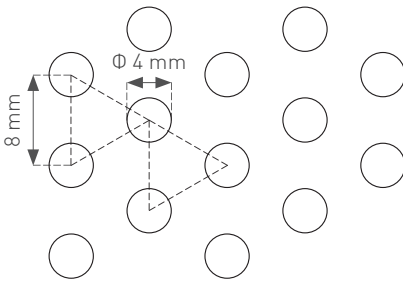
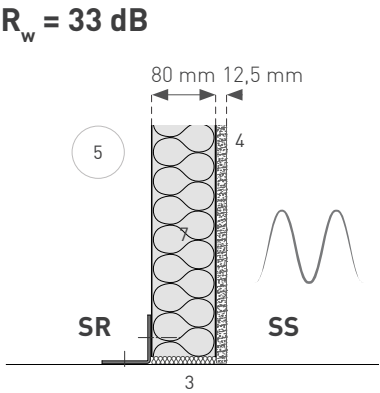
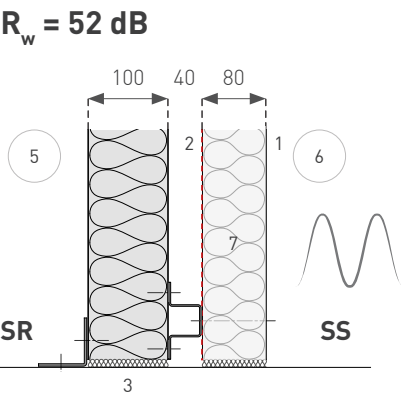
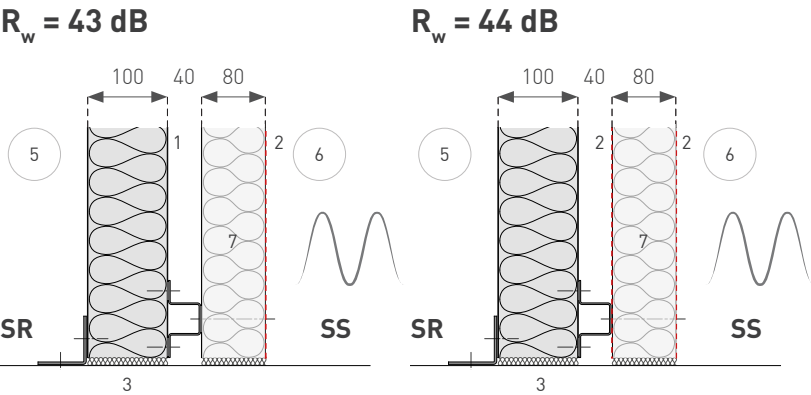


Fig. 1.8: Trimoterm Sound perforation RV 4x8 pattern

4. Trimoterm FTV panel + Trimoterm Sound panel wall:



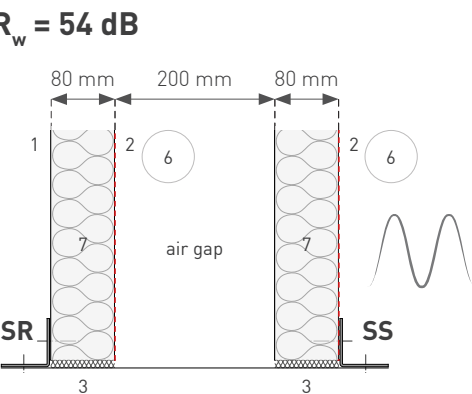
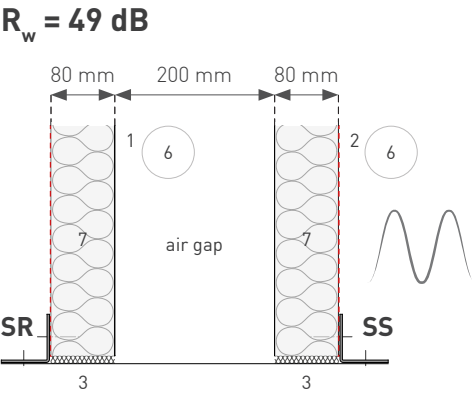
1. Steel sheet,
2. Perforated steel sheet,
3. Mineral stone wool,
4. Gypsum board,
5. Trimoterm FTV,
6. Trimoterm Sound,
7. Power T mineral wool core,

SS - Sound source
SR - Sound reception

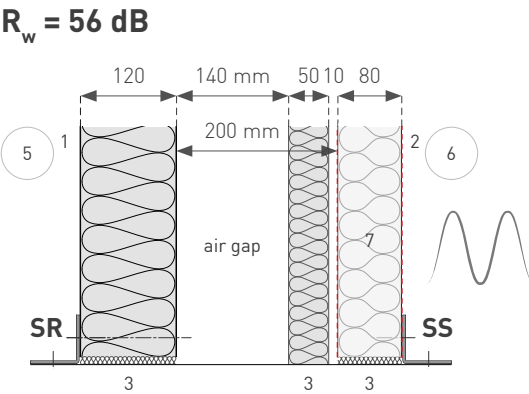


B

5. Trimoterm Sound panel + air gap + Trimoterm Sound panel wall:



6. Trimoterm FTV panel + air gap + layer of mineral wool + Trimoterm Sound panel wall:



1. Steel sheet,
 2. Perforated steel sheet,
 3. Mineral stone wool,
 4. Gypsum board,
 5. Trimoterm FTV,
 6. Trimoterm Sound,
 7. Power T mineral wool core,
- SS - Sound source
SR - Sound reception

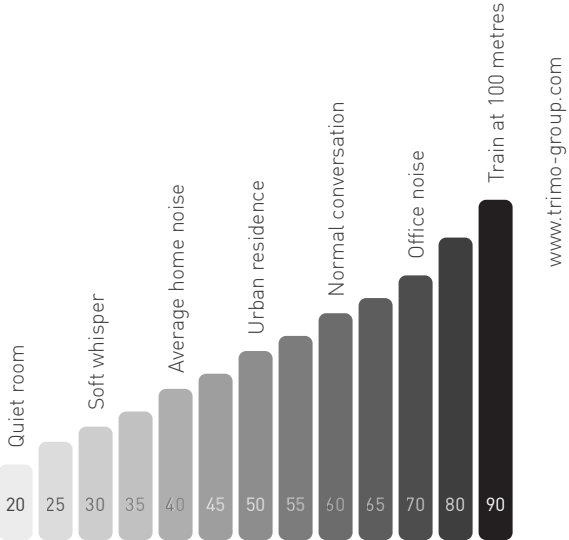


Fig. 1.9: Noise levels (dB)



B

B3.4 Fire safety

Trimoterm FTV panels are designed to meet the highest standards of passive fire protection, ensuring safety, performance and compliance across a wide range of building applications.

The fire performance of mineral wool sandwich panels is evaluated using the following criteria:

- Fire resistance
- Reaction to fire

Fire resistance

Fire resistance is the ability of the panels to maintain their structural capacity, integrity and insulation properties during a fire. 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. Fire resistance criteria classes are:

R (load-bearing capacity)
Ability to maintain load-bearing without a 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.

For complete technical specifications, span tables and certified installation details, refer to the document: Trimoterm fire application.



Trimoterm fire application



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.



B

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.

The EN 13501-1 classification system for the reaction of construction products to fire includes the main combustibility classes and additional classes for smoke and flaming droplets.

The first symbol of classifications (A1 / A2 / B / C / D / E / F) denotes their combustibility and contribution to fire. The second symbol (s) refers to the level of smoke propagation and the third symbol (d) indicates the presence of flaming droplets in the first 10 minutes.

1st symbol (combustibility fire class)
Materials classified A1 and A2 are incombustible, class B are non-flammable, while class F is, in the specific case of sandwich panels, not tested for fire.

2nd symbol (smoke propagation level)
This parameter deals with the emission of fumes.

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

3rd symbol (presence of flaming droplets)
This parameter deals with the presence of flaming droplets or particles that develop during combustion and can spread the fire.

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

Trimoterm mineral wool sandwich panels are

A2-s1,d0

rated with no significant contribution to fire growth.

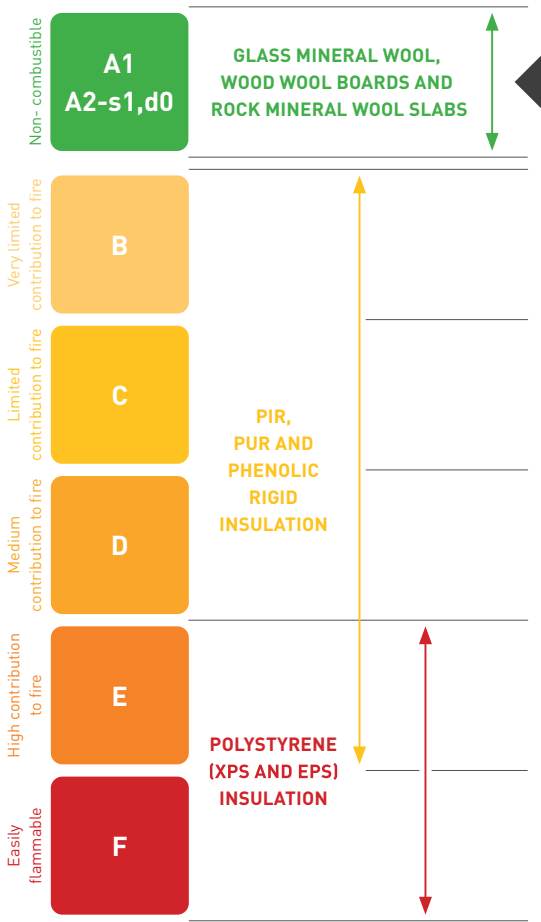


Fig. 2.0: Combustibility Classes (EN 13501-1):

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.



B

B3.5 Protection against corrosion

Unprotected steel in the atmosphere is subject to corrosion. The corrosion of structural steel is an electrochemical process that requires the simultaneous presence of moisture and oxygen.

The insulated sandwich panels have two metal faces that correspond to the external environment (external steel sheet) and internal environment (internal steel sheet); the choice of the corrosion protection of the steel sheet is a determining factor that designers and installers must specify. The metal steel sheet is protected with a coating of corrosion protection in compliance with EN 10346, and additionally protected by an organic coating in accordance with the coil-coating process (EN 10169/1).

Atmospheric corrosivity categories (C)

The ISO 12944:2019 standard divides the environmental corrosion risk into six categories, with explanations for atmospheric corrosivity categories provided below.

Corrosivity cat.	Exterior	Interior
● C1 (Very low)	None	Heated buildings with a clean atmosphere.
● C2 (Low)	Atmosphere with low pollution.	Buildings not heated, where condensation may occur
● C3 (Medium)	Urban and industrial areas with low SO ₂ pollution.	Buildings for production with high atmospheric humidity
● C4 (High)	Industrial areas and coastal areas with moderate salt impact.	Chemical manufacturers, swimming baths and shipyards by the sea.
● C5-I (Very high)	Industrial areas with high SO ₂ levels and an aggressive atmosphere.	Buildings with almost permanent condensation and high pollution.
● C5-M (Very high)	Coast and offshore areas with a high salt content.	Buildings with almost permanent condensation and high pollution.
● CX (Extreme)	Areas with high salinity and a sub-tropical or tropical atmosphere.	Industrial with extreme humidity.

Corrosion resistance categories (RC)

The corrosion resistance categories in EN 10169:2022 were defined based on extensive testing and performance criteria to ensure that coated steel can withstand various environmental conditions.

Based on the test results, the samples are classified into different corrosion resistance categories (RC1 to RC5+). Each category represents a different level of resistance, with RC5+ being the highest, suitable for extremely aggressive environments.

Corrosion protection categories for building interiors (CPI)

The CPI categories in EN 10169:2022 are determined through a series of tests and evaluations designed to assess the performance of coated steel products in various environmental conditions.

Based on the test results, samples are classified into different CPI categories (CPI 1 to CPI 5). Each category represents a different level of resistance, with CPI 5 being the highest, suitable for extremely aggressive environments.

Corrosion protection (interior) cat.	● CPI1	● CPI2	● CPI3	● CPI4	● CPI5
Test duration (h)	None	500	1.000	1.500	1.500

UV resistance categories (R_{UV})

Resistance against the loss of gloss and colour. At locations with high solar radiation, for objects with high aesthetic requirements or that have intensive colours, the use of material with high UV resistance (min. R_{UV} 4) is required.



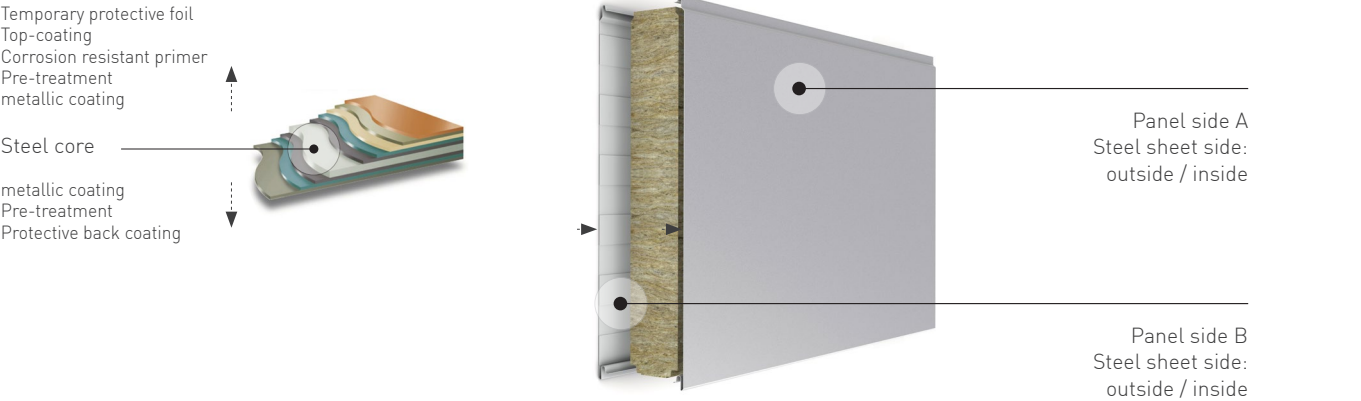
B

Type of coating				SP	PVDF	PVDF+	PUR/PA	PRISMA	HPS	PVC(F)	Stainless st.
Total organic thickness [µm] [EN 13523-1]				25	25	35-57	50-65	40-65	200	120-150	304, 304L, 316, 316L
Corrosion resistance category		External [EN 10169]		RC3	RC3	RC4	RC5	RC5+	RC5	/	
		Internal [EN 10169]		CPI3	CPI3	CPI5	CPI5	CPI5	CPI5	CPI3	
Types of outdoor atmosphere/ corrosivity category	Rural - normal		● C2	OK	OK	OK	OK	OK	OK	OK internal use only	
	Urban and light industrial (low SO ₂)		● C3	OK	OK	OK	OK	OK	OK	OK internal use only	
	Industrial (Moderate SO ₂)		● C4	Unsuitable	Unsuitable	Contact Trimo	OK	OK	OK	OK internal use only	
	Marine	> 5 km from the sea	● C5- M	Unsuitable	Unsuitable	Contact Trimo	Contact Trimo	OK	OK	OK internal use only	
		0 < 5 km from the sea	● C5- M	Unsuitable	Unsuitable	Contact Trimo	Contact Trimo	OK	OK	OK internal use only	
	Severe industrial		● C5 - I	Unsuitable	Unsuitable	Contact Trimo	Contact Trimo	Contact Trimo	Contact Trimo	Contact Trimo	
Temperature resistance [°C]				80	110	110	80	100-110	70	60	
UV resistance category [EN 13523-10]				R _{UV} 3	R _{UV} 4	R _{UV} 4	R _{UV} 4	R _{UV} 4	R _{UV} 4	/	

Tab. 1.1: Steel sheet coatings and their suitability for atmospheric corrosively categories.

The information provided in this table offers a general overview of the available steel sheet coatings and their suitability for different atmospheric categories. For detailed guidance and to ensure the appropriate coating selection for your specific project, please consult with a Trimo representative.

Fig. 2.1: Panel composition and coating structure example





B

B3.6 Colours

A wide range of colour finishes is available for any building, which are engineered to capture the perfect appearance of the building design, both internally and externally. The colour range does not define the delivery terms.

Trimoterm steel sheet metal is hot galvanised in compliance with EN 10346 and additionally protected by an organic coating in accordance with the coil-coating process (EN 10169/1). Please note that not all colours are available for every type of coating. For details on specific colour options, consult your Trimo representative.

The colour of the external steel sheet influences the self-heating temperature of the panel surface, when exposed to sun rays, which can result in thermal expansion properties. We distinguish three colour groups:

- Group I - very bright colours
- Group II - bright colours
- Group III - dark colours

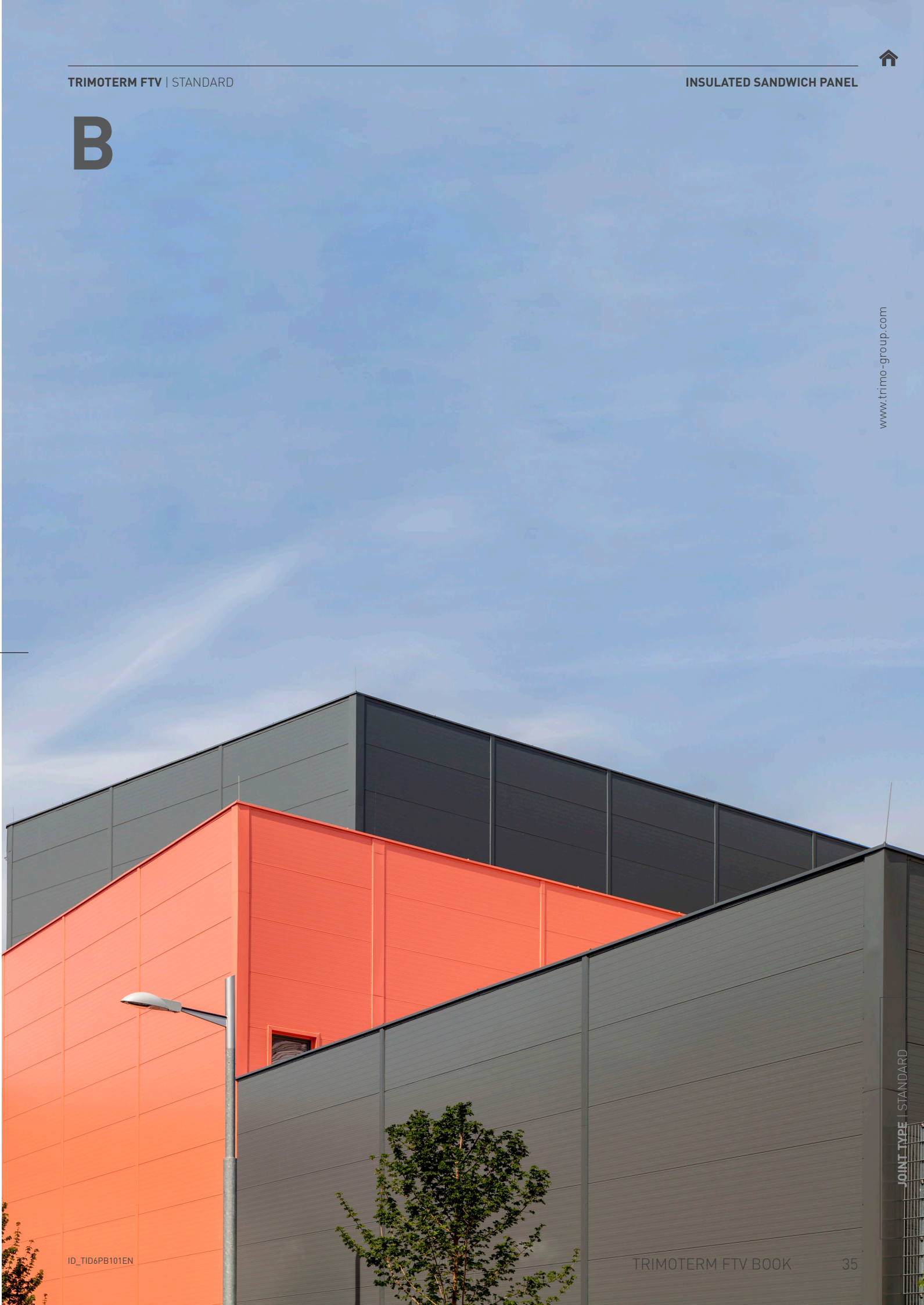
We advise against using wall panels with dark colours in multi-span systems due to possible steel sheet deformations. It is recommended to install such panels at ambient temperatures above 10°C.



Fig. 2.2: The colours shown represent only a fraction of the colours available.



B





B

B4 Special elements

B4.1 Trimoterm FTV corner elements

From the basic Trimoterm FTV panel, we can prefabricate corner elements as shown on the following pages. Specific geometrical limitations are given for each corner element separately. Please also consider the general notes:

- All corner elements are closed on the internal side with a zinc-coated L-profile (this may be visible from the inside).
- Longitudinal rounded elements are only available in combination with a micro-lined (M) external steel sheet profile.
- Corner elements are made from Trimoterm FTV panels that are produced together with other flat façade panels.
- Consider the feasibility of use for specific projects, such as structural capacity, fire-related requirements, etc.

Corner side designations

The principle for designating the sides of corner elements shown in a plan view of four corners of a building with side designations.

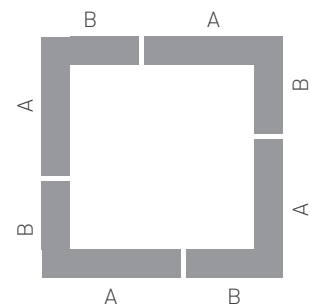


Fig. 2.3: L-corner element designation

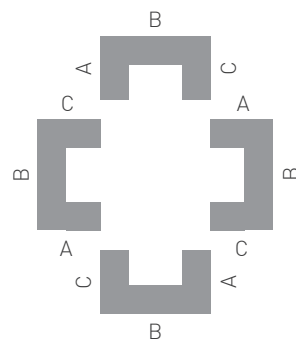
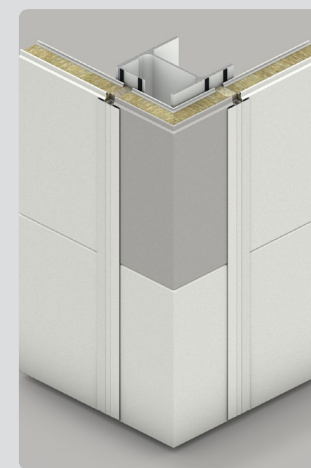


Fig. 2.4: U-corner elements designation



B

In addition to flat Trimoterm panels, Trimo produces various corner elements that enable aesthetic finishes of the façade edges. Explore the Trimoterm corner elements below:



L-corner

Transversal

This element with a sharp edge can be used for the outside corner of a horizontal façade.



U-corner

Transversal

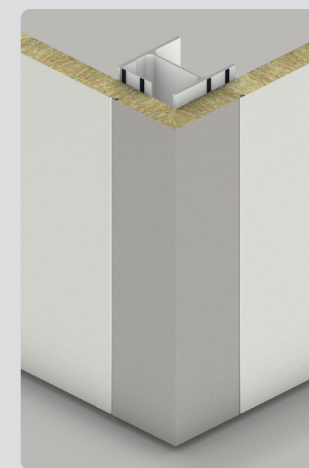
This element with a sharp edge can be used for the double outside corner of a horizontal façade.



L-corner (cut edge)

Longitudinal

This element with a sharp edge can be used for the outside corner of a vertical façade.



L-corner (groove/tongue)

Longitudinal

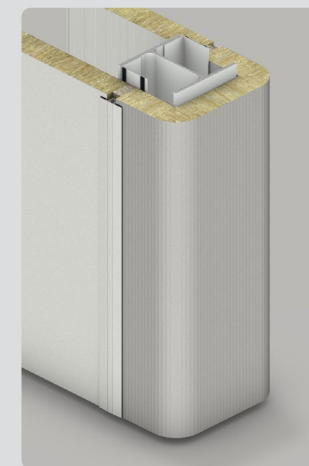
This element with a sharp edge can be used for the outside corner of a vertical façade.



Rounded L-corner

Longitudinal

This element with a rounded edge can be used for the outside corner of a vertical façade.



Rounded U-corner

Longitudinal

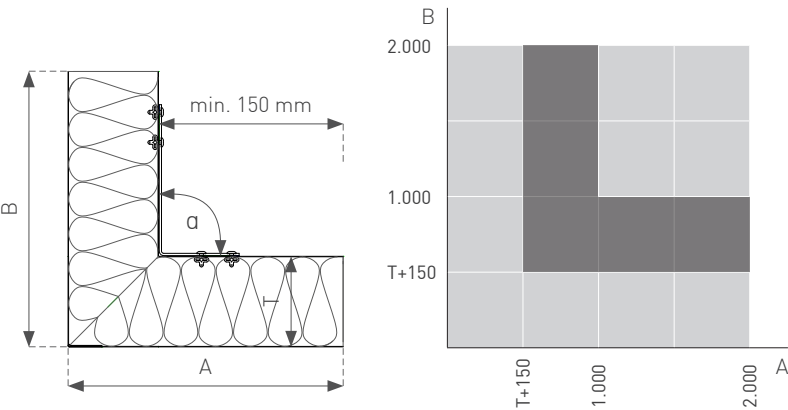
This element with a rounded edge can be used for the double outside corner of a vertical façade.



B

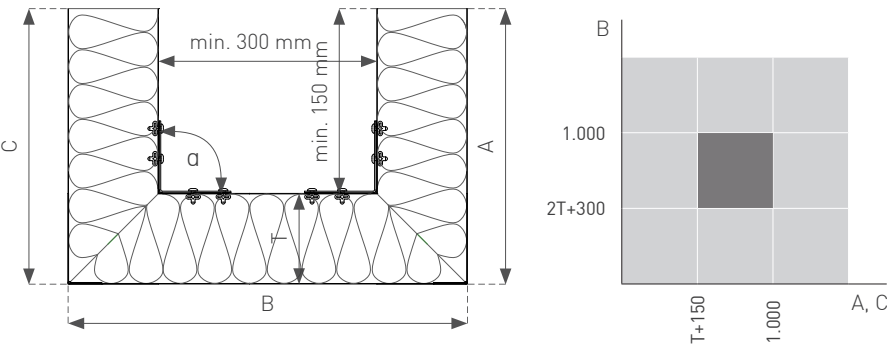
Transversal L-corner element

Panel thickness [T]	50-250 mm
$(A+B)_{max}$	3.000 mm
A_{min}/B_{min}	T+150 mm
A_{max}/B_{max}	2000 mm
B_{max}/A_{max}	1000 mm
angle [α]	75°-175°



Transversal U-corner element

Panel thickness [T]	50-250 mm
$(A+B+C)_{max}$	3.000 mm
B_{min}	2T+300 mm
A_{min}/C_{min}	T+150 mm
$A_{max}/B_{max}/C_{max}$	1000 mm
angle [α]	75°-175°

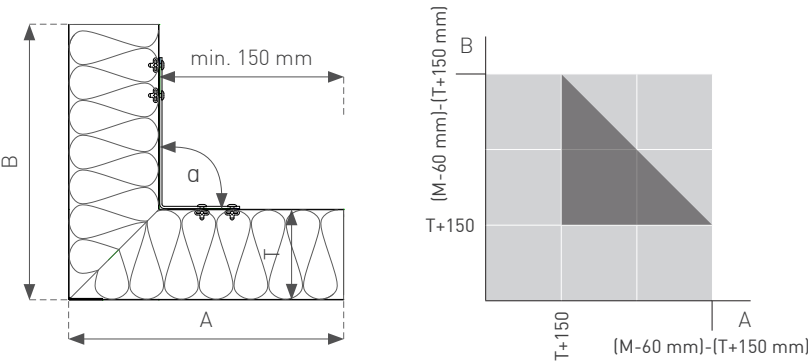


B

Longitudinal L-corner element (cut edge)

Panel thickness [T]	50-150/250* mm
L_{max}	8.000 mm
A_{min}/B_{min}	T+150 mm
A_{max}/B_{max}	(M-60 mm)-(T+150 mm)
$(A+B)_{max}$	M-60 mm
angle [α]	80°-175°

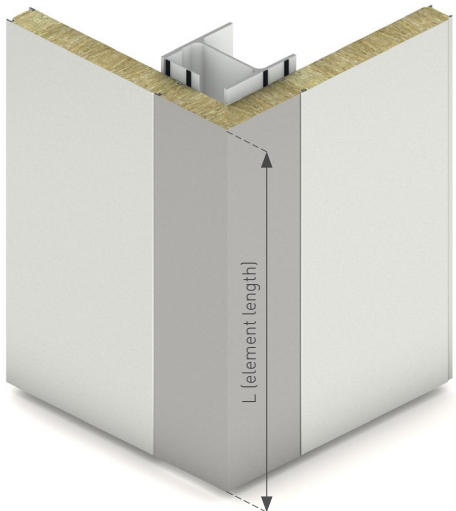
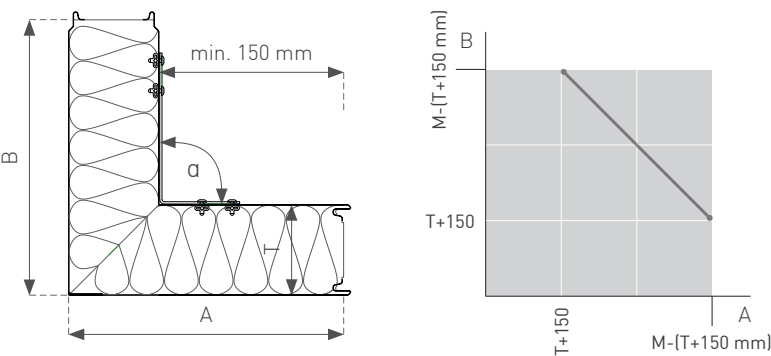
* For 150-250 mm thicknesses, check with technical support.



Longitudinal L-corner element (groove/tongue edge)

Panel thickness [T]	50-150/250* mm
L_{max}	8.000 mm
A_{min}/B_{min}	T+150 mm
A_{max}/B_{max}	M-(T+150 mm)
$(A+B)$	M
angle [α]	80°-175°

* For 150-250 mm thicknesses, check with technical support.



L - Length (mm)
M - Module width (mm)
T - Panel thickness



B

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JOINT TYPE | STANDARD

L I G H T W E A R .

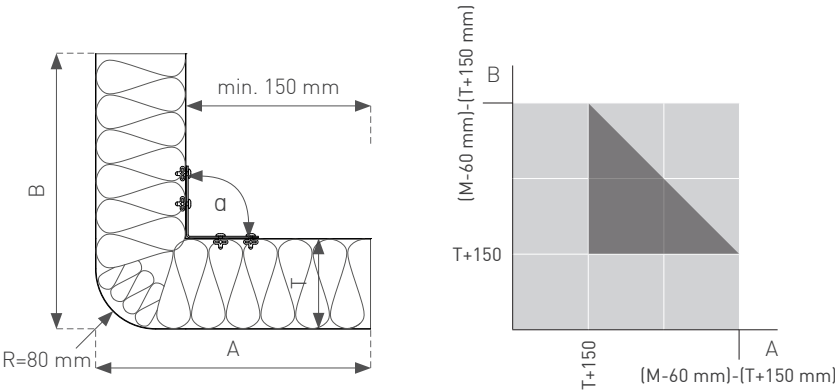


B

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Longitudinal rounded L-corner element

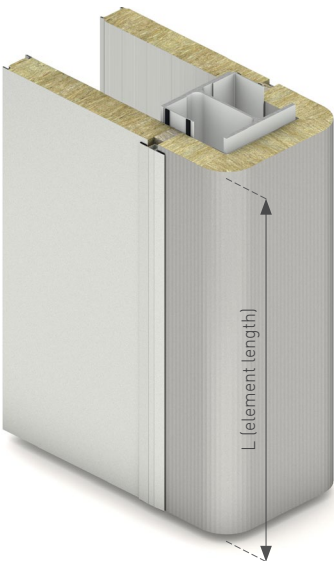
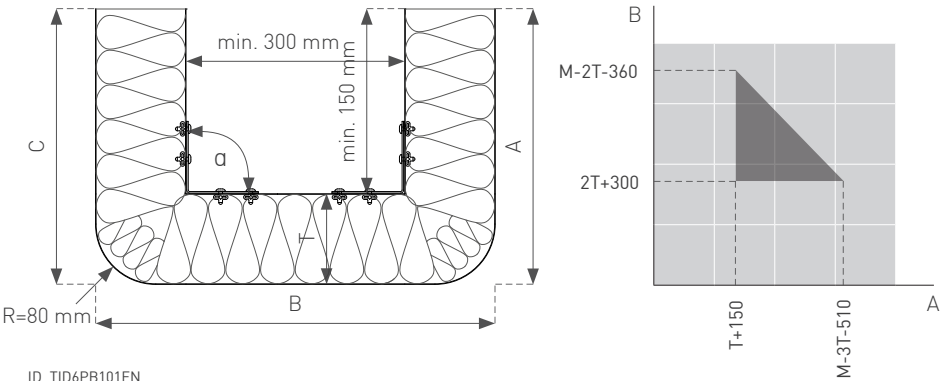
Panel thickness [T]	50-250 mm
L_{max}	10.000 mm
A_{min}/B_{min}	T+150 mm
A_{max}/B_{max}	(M-60 mm)-(T+150 mm)
$(A+B)_{max}$	M-60 mm
angle [α]	75°-175°



L - Length (mm)
M - Module width (mm)
T - Panel thickness

Longitudinal rounded U-corner element

Panel thickness [T]	50-133 mm
L_{max}	10.000 mm
$(A+B+C)_{max}$	M-60 mm
B_{min}	2T+300 mm
A_{min}/C_{min}	T+150 mm
angle [α]	90°-175°



JOINT TYPE | STANDARD

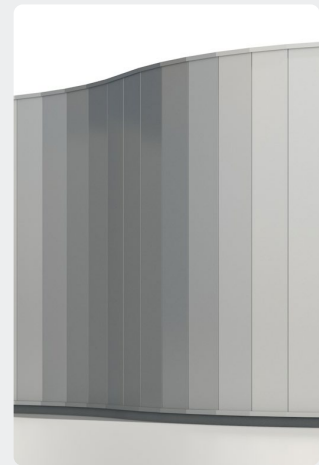


B

B4.2 Trimoterm FTV curved elements

With Trimoterm panels, you can achieve curved shapes on façades using two methods:

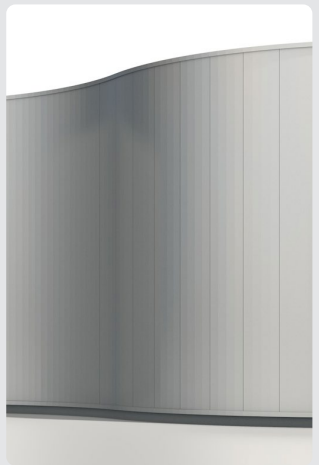
- Installing flat panels in a curved shape without the need for special elements.
- Using segmentally curved elements.



Curved façade & flat panels

Minimal façade curvature can be achieved with flat panels and careful joint rotation to ensure watertightness.

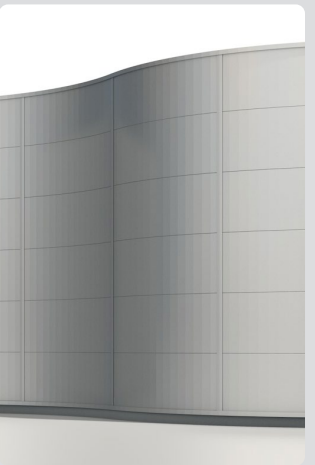
Flat panels



Segmented elements
Longitudinal

Curvature is achieved with segmentally curved elements in the longitudinal direction. Visible lines may occur depending on the radius and steel sheet profile - check the limits on the following pages.

Segmentally curved elements



Segmented elements
Transversal

Curvature is achieved with segmentally curved elements in the transversal direction. Visible lines may occur depending on the radius and steel sheet profile - check the limits on the following pages.

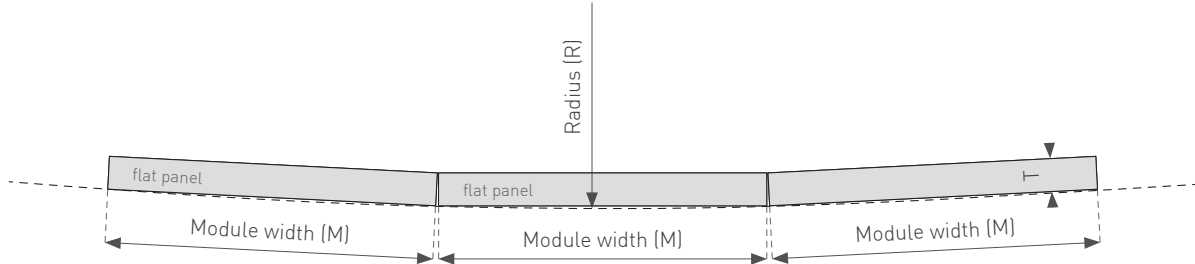


B

Curved façade with flat panels

When the curvature of the façade is minimal, it can be achieved using flat panels with slight rotation at the panel joints. This rotation should be carefully considered and managed during the design phase to ensure that it does not exceed the maximum joint opening, which could lead to watertightness issues.

The minimum radii shown below ensure proper watertightness, as the maximum joint openings at these connections are effectively sealed by factory-applied gaskets.



R _{min} [m] for Trimoterm FTV mineral wool sandwich flat panels							
Panel thickness [T]	Panel modular width [mm]						
	600	700	800	900	1000	1100	1200
60	11.9	13.9	16.0	19.9	20.0	22.0	23.9
80	15.9	18.6	21.3	23.9	26.6	29.3	31.9
100	19.9	23.3	26.6	29.9	33.3	36.6	39.9
120	23.9	27.9	31.9	35.9	39.9	43.9	47.9
133	26.6	31.0	35.4	39.9	44.3	48.7	53.2
150	29.9	34.9	39.9	44.9	49.9	54.9	59.9
172	34.4	40.1	45.8	51.6	57.3	63.0	68.8
200	39.9	46.6	53.2	59.9	66.5	73.2	79.9
220	44.0	51.3	58.6	66.0	73.3	80.6	88.0
240	47.9	55.9	63.9	71.9	79.9	87.9	95.9
250*	50.0	58.3	66.6	75.0	83.3	91.6	100.0

Tab. 1.2: Minimum radiuses of a curved façade with flat Trimoterm panels.



B

Segmentally curved elements

From the basic Trimoterm FTV mineral wool sandwich panel, we can prefabricate segmentally curved elements as shown on the following pages. Specific geometrical limitations are given for each element separately. Please also consider the additional notes and warnings.

A - External surface of a curved element

The external surface of the element remains intact but visible lines may appear where cuts are made on the internal side, as these lines can transfer to the outside. The density of the visible lines depends on:

- the radius (larger radii result in fewer visible lines) and
- the steel sheet profile (refer to the table for each element).

B - Internal surface of a curved element

During manufacture, the internal side of the element is segmented and the cuts are sealed with tape. Additionally, the panel is reinforced with straps placed perpendicular to the cut lines.

Upon request, if the surface will be visible from the inside, we can install straps parallel to the cut lines in the same colour as the steel sheet to make the surface more aesthetically pleasing.

! NOTES & WARNINGS

- The internal surface of the curved element has visible reinforcements
- The external surface of the curved element has visible bending lines
- Curved elements are made from Trimoterm FTV panels that are produced together with other flat façade panels.
- Consider the feasibility of use for specific projects, such as structural capacity, fire-related requirements, etc.

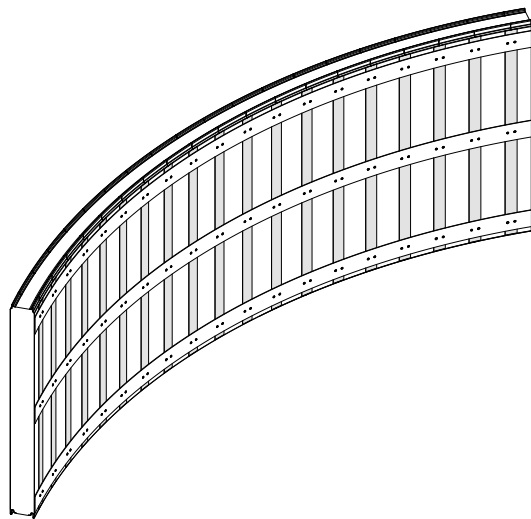


Fig. 2.5: Internal side of a segmentally curved element – perpendicular straps

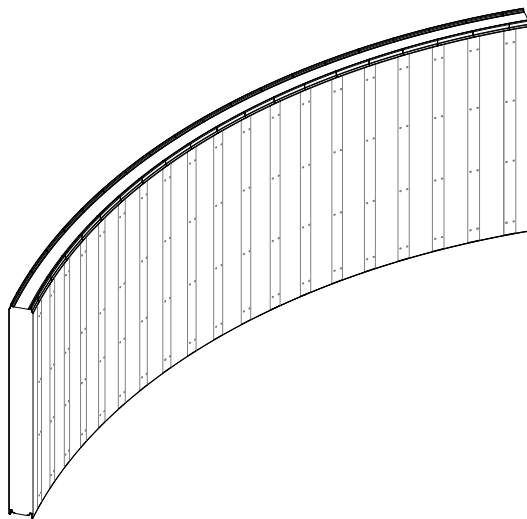
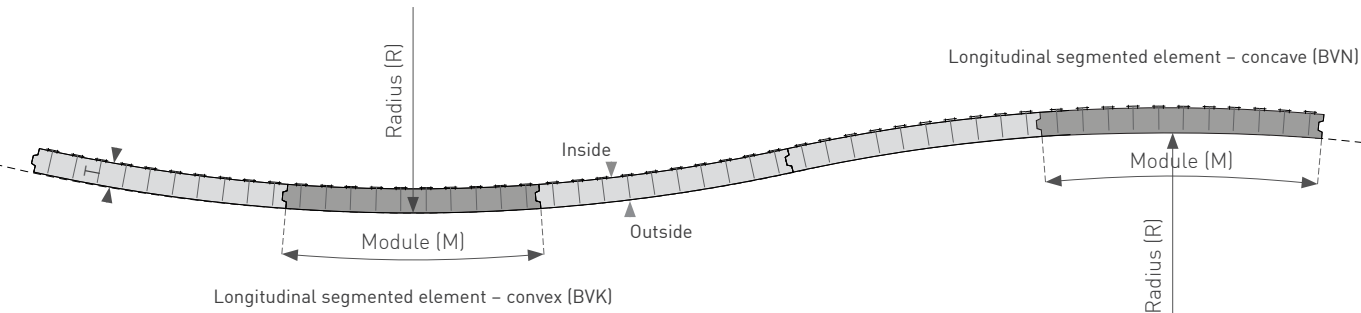


Fig. 2.6: Internal side of a segmentally curved element – parallel straps (upon request)



B

Longitudinal segmented elements



L_{max}	6.000 mm
Recommended support distance	2.000 mm
Module (M)	600-1.200 mm

Minimal radius (R) at panel thickness (T)	
T [mm]	R_{min} [m]
60	1.5
80	1.9
100	2.4
120	2.9
133	3.2
150	3.5
172	4.1
200	4.8
220	5.2
240	5.6
250*	6.0

* For the French or German markets, consult Trimoterm's technical support to comply with the regional legislation.

Visibility of bending lines on the external side	
Steel sheet profile	Bending line visibility
S (standard) profile	Bending lines visible
G (smooth) profile	Bending lines visible
V, V2 profile	Bending lines visible
M, M2, M3, M8 (micro-lined) profile	Bending lines less visible

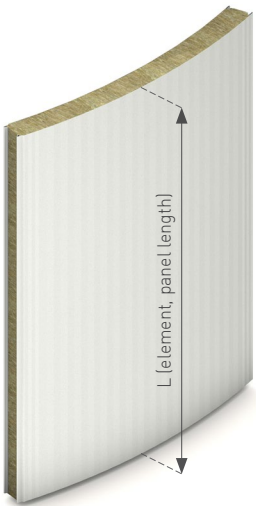
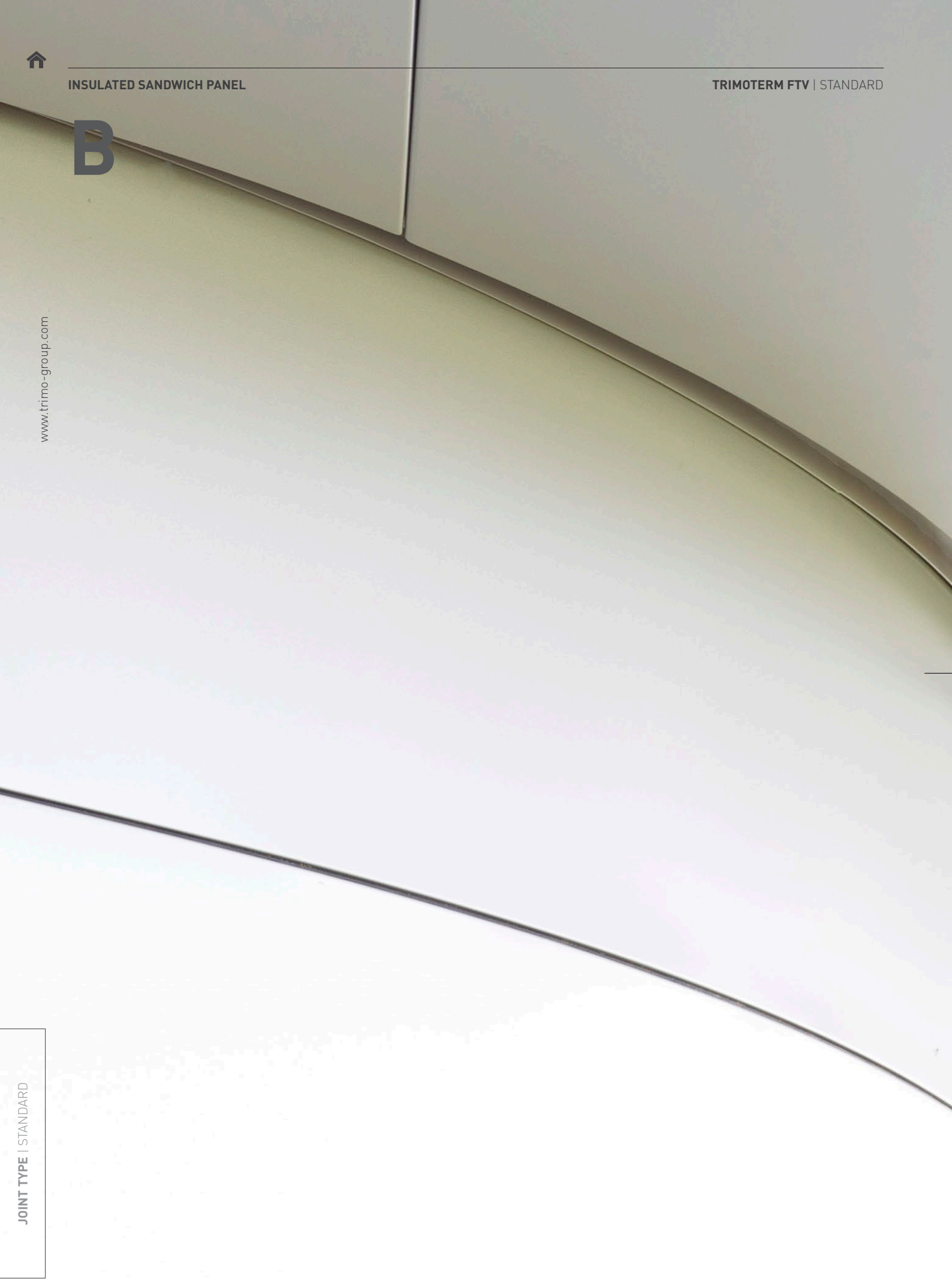


Fig. 2.7: Longitudinal segmented element – convex



Fig. 2.8: Longitudinal segmented element – concave



B

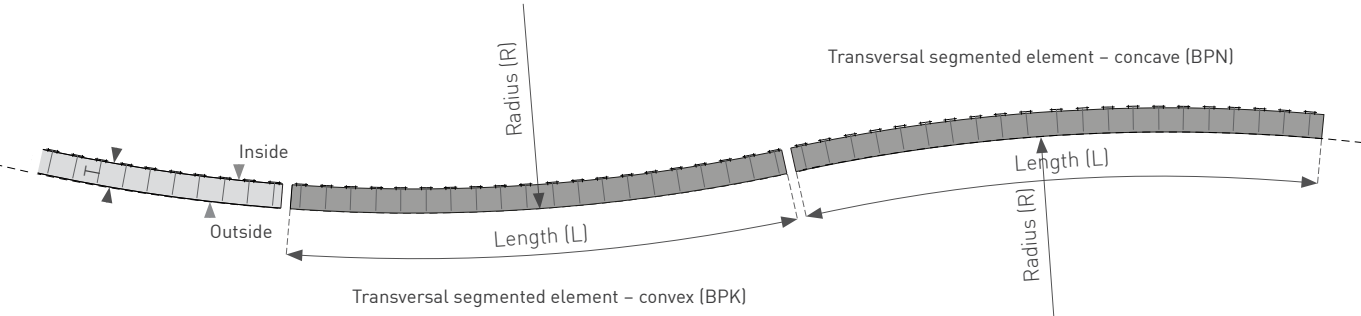
www.trimo-group.com



B

www.trimo-group.com

Transversal segmented elements



L_{max}	4.000 mm
Module (M)	600-1.200 mm

Minimal radius (R) at panel thickness (T)	
T [mm]	R_{min} [m]
60	3.0
80	3.9
100	4.9
120	5.9
133	6.5
150	7.3
172	8.4
200	9.8
220	11.5
240	12.5
250*	13.0

* For the French or German markets, consult Trimo's technical support to comply with the regional legislation.

Visibility of bending lines on the external side	
Steel sheet profile	Bending line visibility
S (standard) profile	Bending lines visible
G (smooth) profile	Bending lines visible
V, V2 profile	Bending lines visible
M, M2, M3, M8 (micro-lined) profile	Bending lines visible

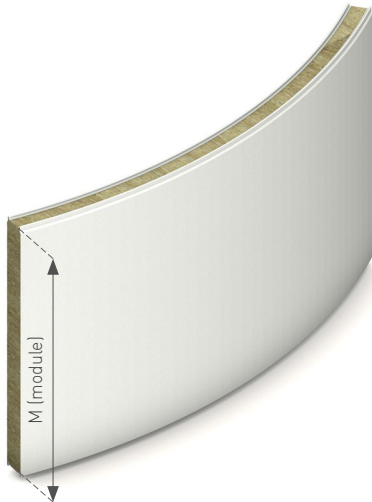


Fig. 2.9: Transversal segmented element – convex

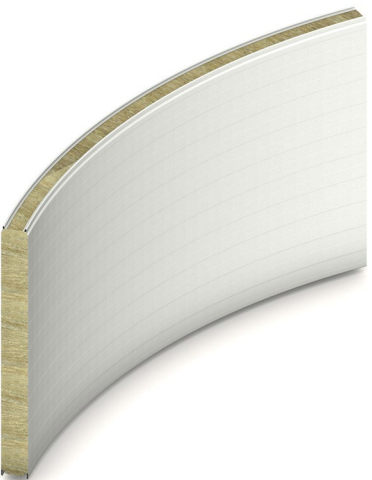


Fig. 3.0: Transversal segmented element – convex



B

B4.3 Trimoterm FTV ArtMe

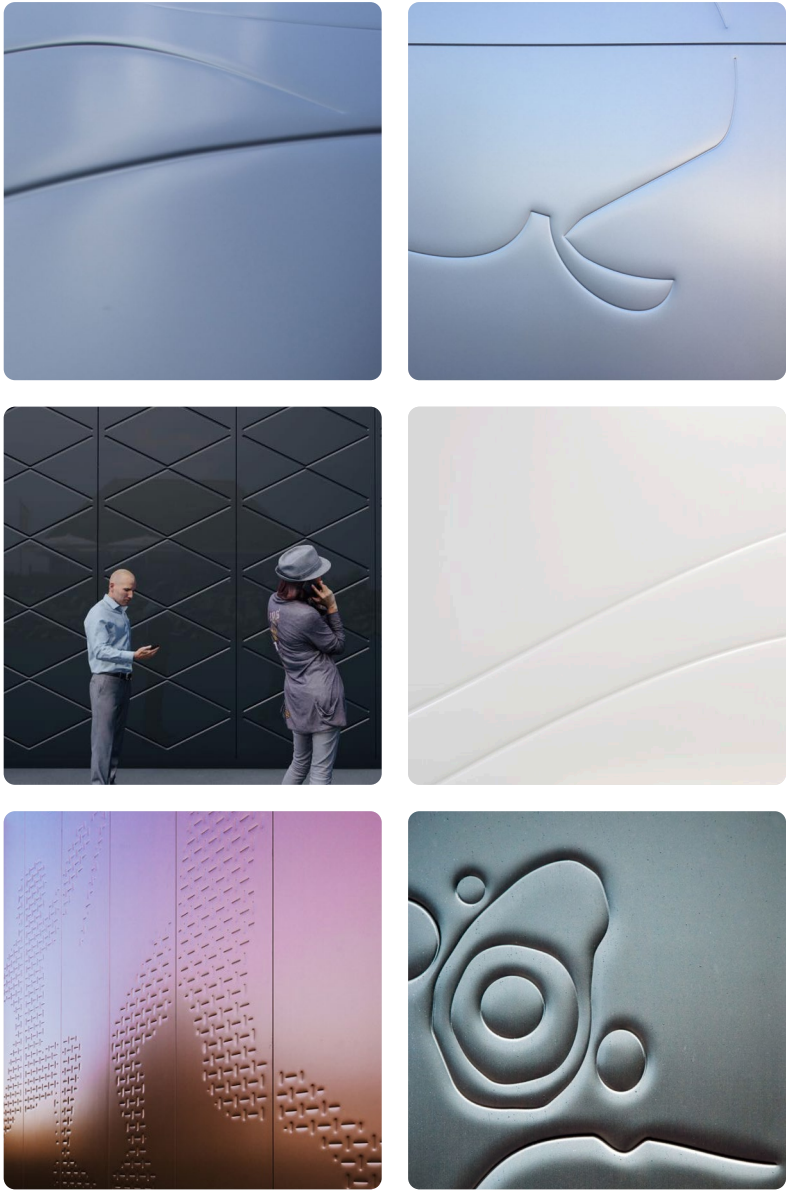
ArtMe is a custom external face of the façade that allows a wide range of shapes, patterns and visual effects to be expressed for dramatic, individual and creative results. It enables many design possibilities - from pictures to inscriptions, logos, brands and bespoke creations.

By using highly controlled 3D-forming technology the embossed design is achieved without any need for adhesives, additional elements or structural devices - and most importantly, the original structural integrity and characteristics of the façade elements are preserved without compromise.

For more design options and instructions, go to:



ArtMe technical guide





C Trimoterm FTV system

C1 System composition

Performance benefits

- Complete envelope system,
- One vendor system,
- Multiple installation options,
- Optimal build speed,
- Design flexibility and aesthetic appeal,
- Superior thermal performance,
- System water & air tightness

C1.1 Complete building envelope system

Trimoterm FTV panels offer a comprehensive solution for building envelopes, combining all the benefits of high-quality façades. With elements prefabricated and produced using the latest technology, the Trimoterm FTV panel system guarantees excellent thermal and sound insulation.

68%

High build speed

Prefabricated panels can be quickly assembled on-site, significantly reducing the construction time.

Traditional methods typically involve more on-site work, which can be time-consuming and subject to delays due to weather or other factors.



C

C1.2 Panel orientation

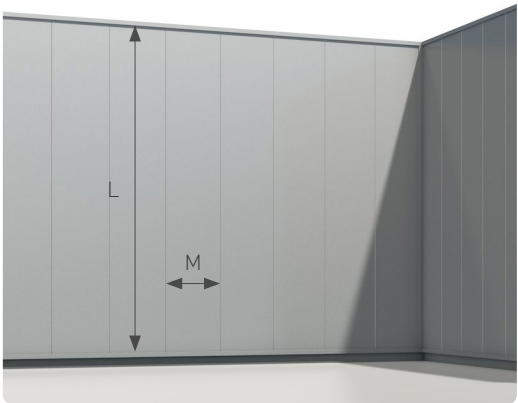
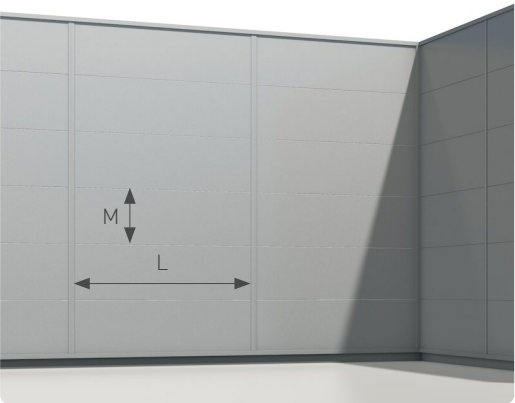
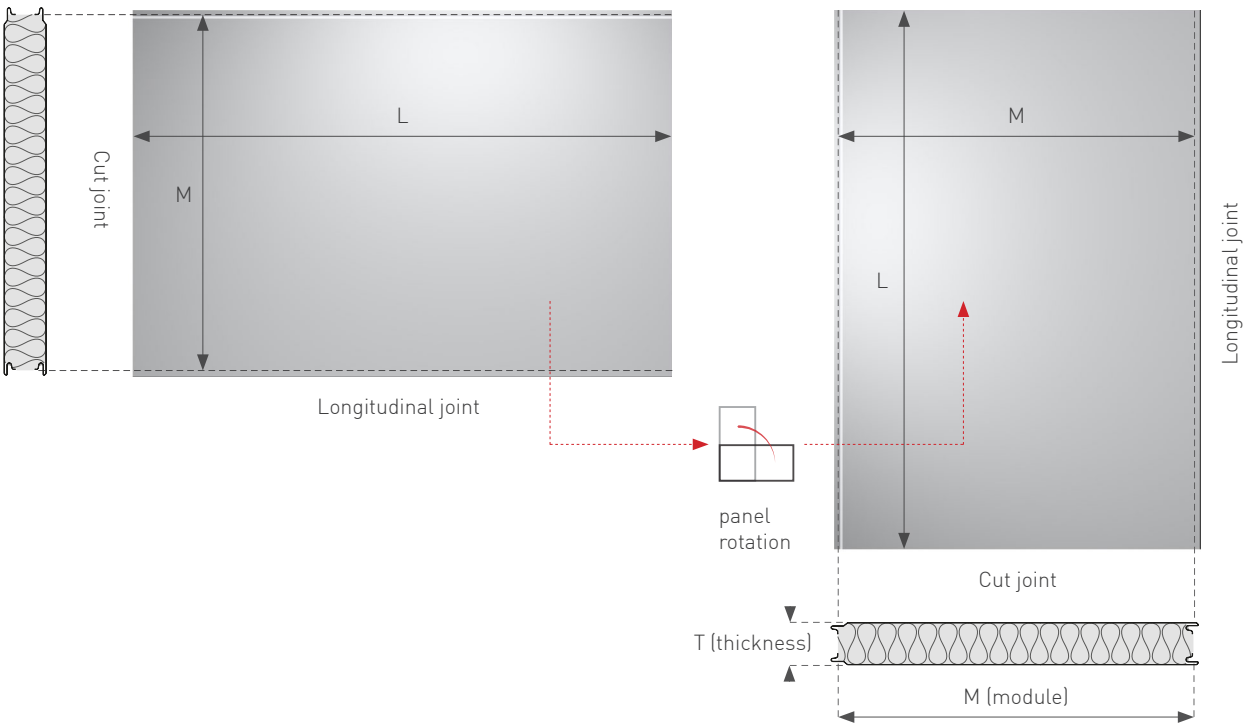
Trimoterm FTV panels can be installed in two primary orientations: vertical and horizontal. Panels can be rotated from horizontal to vertical in any direction, typically considered as counterclockwise (CCW) rotation.

• Trimoterm FTV horizontal orientation

Panels are installed horizontally. Horizontal joints are managed using the tongue and groove system of the panels. Vertical joints are managed with a prolongation detail, as explained in the following chapters.

• Trimoterm FTV vertical orientation

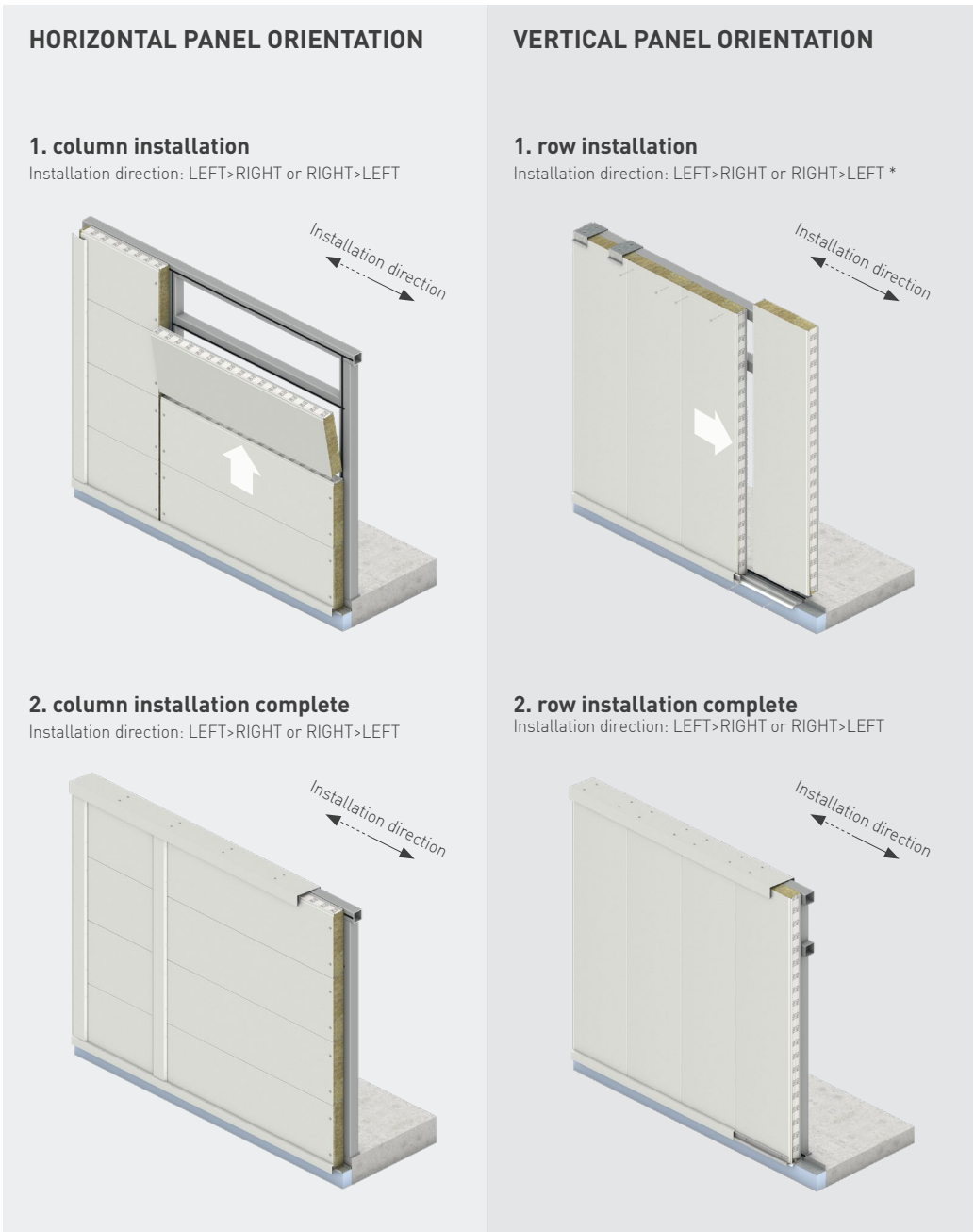
Panels are installed vertically. Horizontal joints are managed with a prolongation detail, as explained in the following chapters. Vertical joints are managed using the tongue and groove system of the panels.



C

C1.3 Installation direction

The panels can be installed in both left-to-right and right-to-left directions, providing versatility in planning and execution. However, it is crucial to note that the installation must always proceed from the bottom to the top. Installing elements from top to bottom is not permitted, as it may compromise the integrity and performance of the system.



* True if the following are respected:

- Panel rotation to change direction,
- Proper design of corner elements,
- Compliance with Trimoterm's technical documentation.



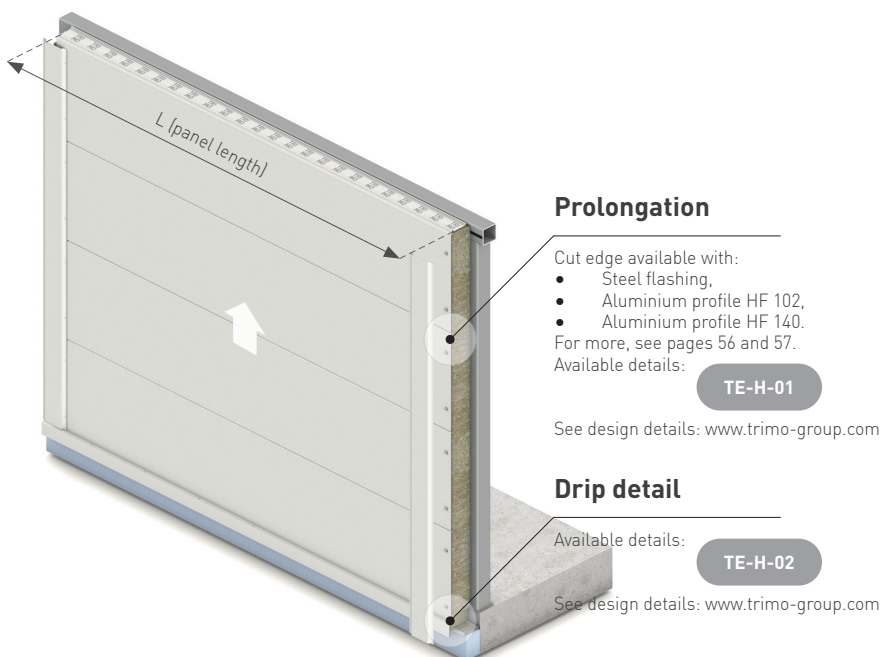
C

HORIZONTAL ORIENTATION of Trimoterm FTV panels

External wall application

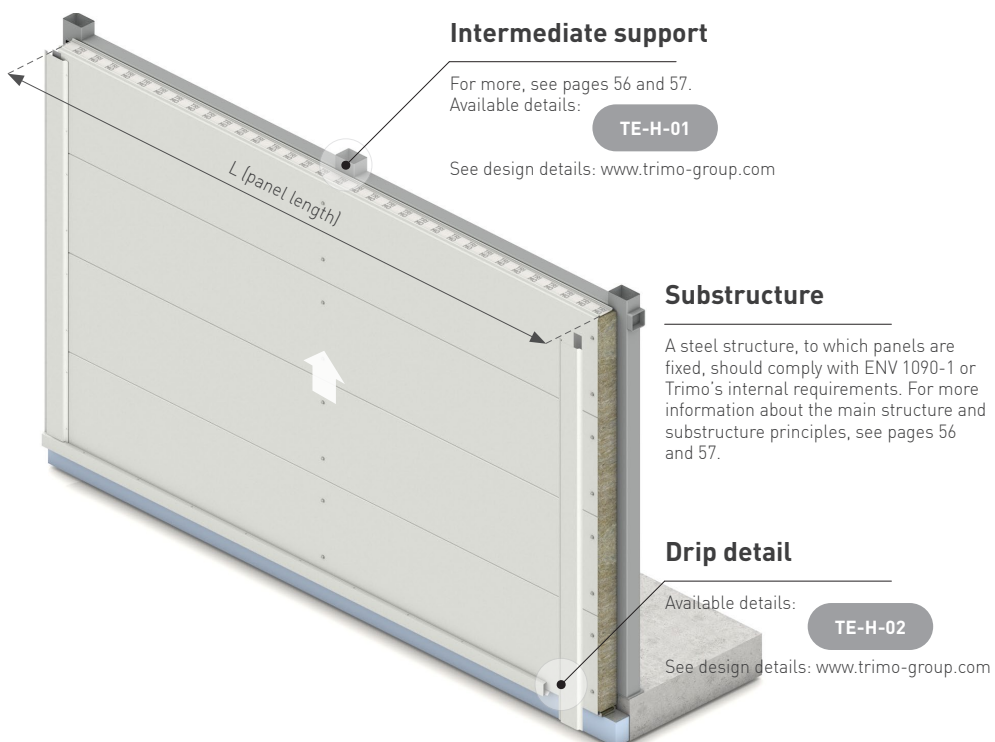
• SINGLE-SPAN

In a single-span system, panels are only fixed at their ends, with the maximum allowed span determined by static calculations based on the expected wind loads.



• MULTI-SPAN

In a multi-span system, the panels are fixed at their ends and middle supports. The maximum allowed spans between supports are defined by static calculations according to the expected wind and temperature loads.



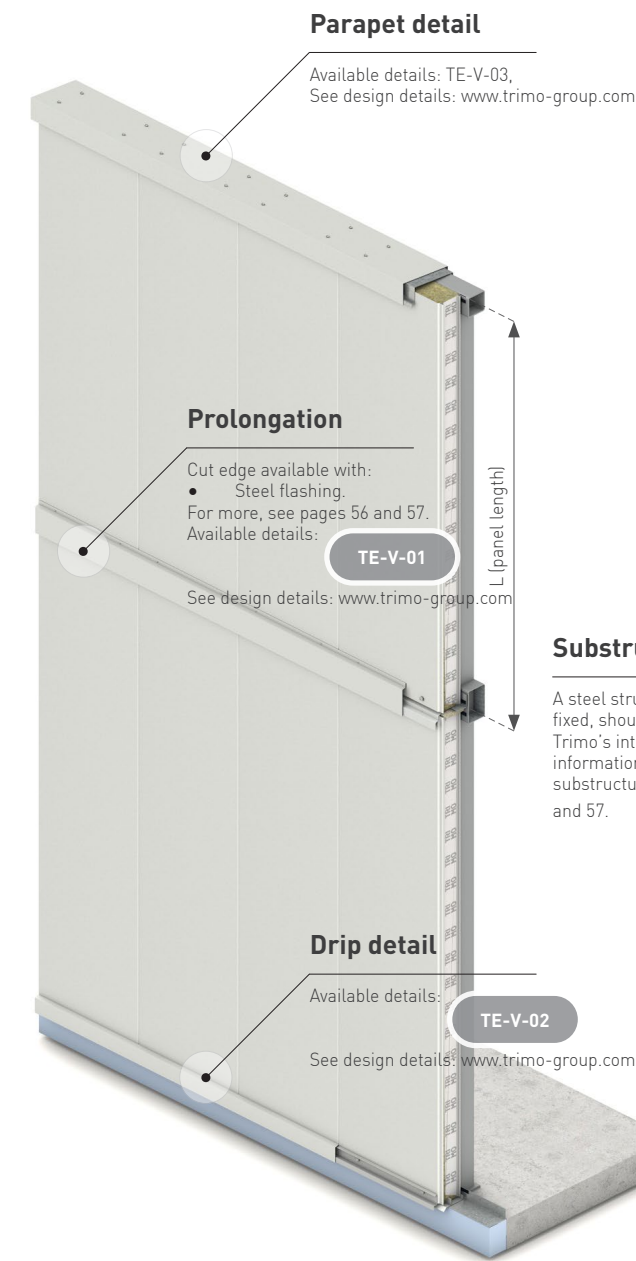
C

VERTICAL ORIENTATION of Trimoterm FTV panels

External wall application

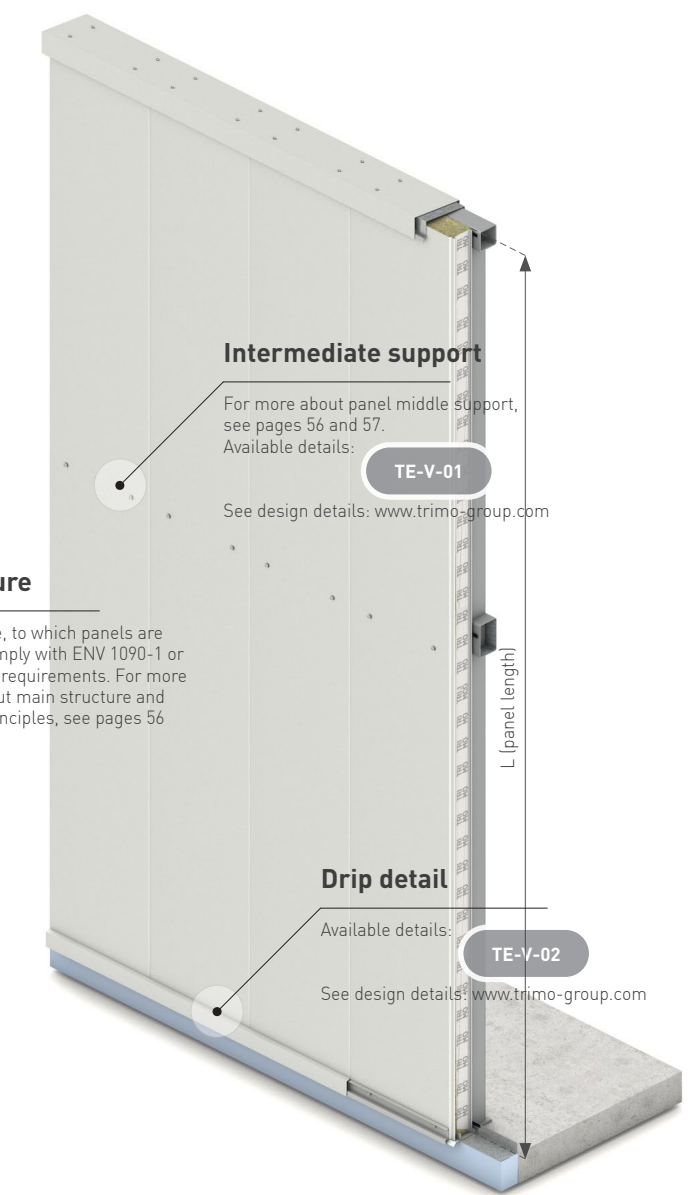
• SINGLE-SPAN

In a single-span system, panels are only fixed at their ends, with the maximum allowed span determined by static calculations based on the expected wind loads.



• MULTI-SPAN

In a multi-span system, the panels are fixed at their ends and middle supports. The maximum allowed spans between supports are defined by static calculations according to the expected wind and temperature loads.





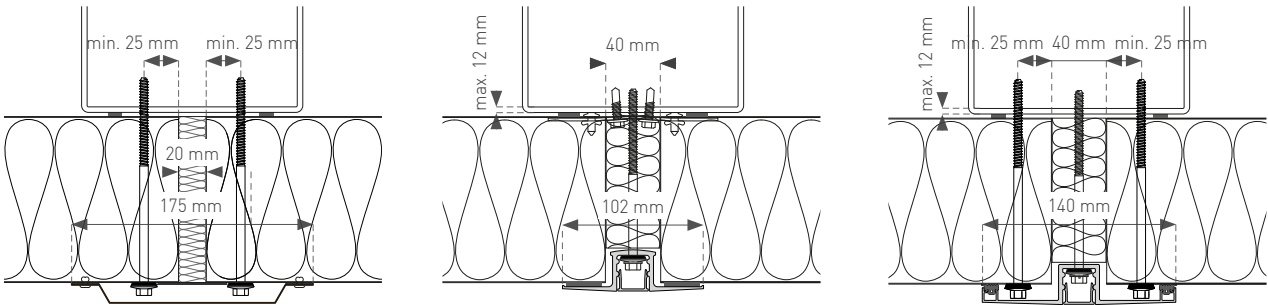
C

C2 Joints, prolongation and fastening

C2.1 Joints and prolongations

To achieve a basic prolongation, each panel should be secured with screws, the gap filled with mineral wool, water-tightness ensured and covered with flashing. For horizontally oriented panels, beside standard flashing prolongation, there are two additional options using aluminium profiles (HF102 and HF140) that offer a more aesthetically pleasing appearance.

For further details, refer to the descriptions of each prolongation type below.



Prolongation with flashing

- **Fastening** / Fastening with screws (19 mm washer),
- **Colour** / Flashing can match the colour of the panel,
- **Spacing** / Free space between the panels: 20 mm,
- **Sealing** / Outside sealing with vapour-permeable tape, inside sealing with PE sealing tape

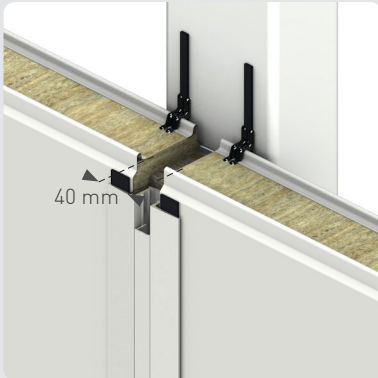
Horizontal panel



Prolongation with HF 102 Aluminium profile

- **Fastening** / Fastening with HF 102 aluminium profile,
- **Colour** / HF 102 is powder coated in any agreed colour (on request, the cover profile can be in another colour) and the screw with a 16 mm washer,
- **Spacing** / Free space between the panels: 40 mm,
- **Sealing** / Outside sealing on HF 102, inside sealing with PE sealing tape

Horizontal panel



Prolongation with HF 140 Aluminium profile

- **Fastening** / Fastening with screws (19 mm washer),
- **Colour** / HF 140 is powder coated in any agreed colour (on request, the cover profile can be in another colour) and the screw with a 16 mm washer,
- **Spacing** / Free space between the panels: 40 mm,
- **Sealing** / Outside sealing with HF 140, inside sealing with PE sealing tape

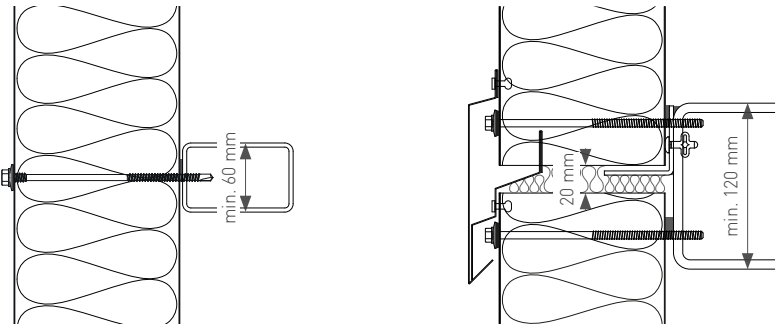
Horizontal panel



C



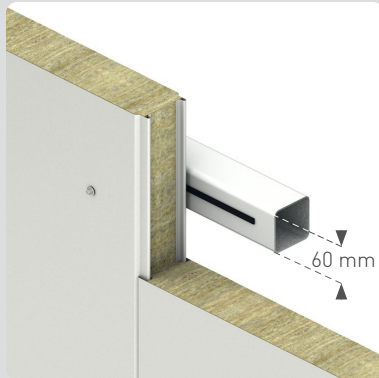
Trimoterm FTV system design details



Intermediate support (multi-span system)

- **Fastening** / Fastening with screws (19 mm washer and second thread required)

Horizontal & vertical panel



Prolongation with flashing

- **Fastening** / Fastening with screws (19 mm washer)
- **Colour** / Flashing can match the colour of the panel
- **Spacing** / Free space between the panels: 20 mm
- **Sealing** / Outside sealing with drip flashing, inside sealing with PE sealing tape

Vertical panel





C

C2.2 Fastening

Fasteners must be subject to static calculation to guarantee resistance to the stresses induced by permanent or dynamic loads. The screw length depends on the panel thickness, type of detail and type of substructure in accordance with the instructions of the screw producer. It is the responsibility of the designer/installer to choose the type, number and position of the fasteners.

Special attention is needed when tightening the screws in order to ensure that they are not under- or over-tightened.

Screws of types A and B are used for fixing to a steel substructure; a hole with a suitable diameter is to be drilled through a panel and substructure in accordance with the instructions of the screw producer. The preliminary drilling of holes is not allowed for screws of type C.

For a list of screws compatible with Trimoterm panels, please refer to the Trimoterm Accessories Catalogue.



Trimoterm accessories catalogue

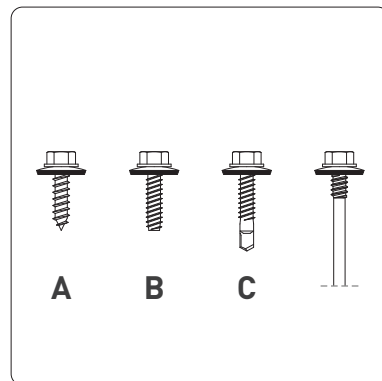


Fig. 3.2: Fixing screw types ABC and screw with a high thread.

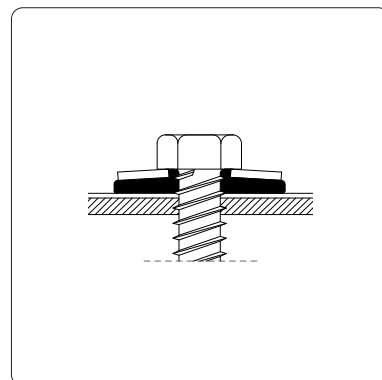


Fig. 3.3: Correctly tightened screw.

! NOTES & WARNINGS

Screw lengths are based on a particular screw supplier. Please check with your own supplier for the required lengths on the basis of the exact design case.



C

The fasteners play a crucial role in securely anchoring the Trimoterm FTV panel to the supporting structure. Typically, screws are used as fastening elements, chosen based on specific factors such as panel thickness, substructure thickness and material. An exception to this is the HF102 profile, which not only serves a decorative purpose but also provides structural support.

See below for a more detailed explanation of both fastening methods.

A. Fastening with screws

- This method is suitable for fire resistance requirements.
- Screws take vertical (weight) and horizontal (wind, thermal) loads from the panel.
- So-called fastening through the panel requires a 19 mm washer (or bigger) and an EPDM gasket underneath.
- For visible fastening (where the screw heads are not covered with flashing or alu profile), screws with a high thread are required.
- The number of screws per panel can be defined by Trimoterm based on the individual static calculation for each project.

B. Fastening with HF 102 Aluminium profile

- HF 102 profile takes horizontal loads (wind). For vertical loads (weight), short screws* are installed in the internal steel sheet.
- Hidden screws in the HF 102 profile must have 16 mm washers and EPDM gaskets underneath.
- The number of screws in HF 102 (pcs/m) can be defined by Trimoterm based on the individual static calculation for each project.

* An additional steel plate is riveted to the internal steel sheet to facilitate the installation of a short screw.

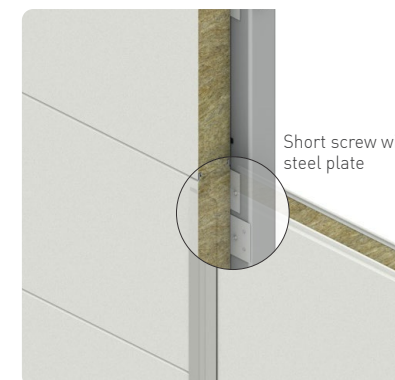


Fig. 3.6: Carrying the vertical load.

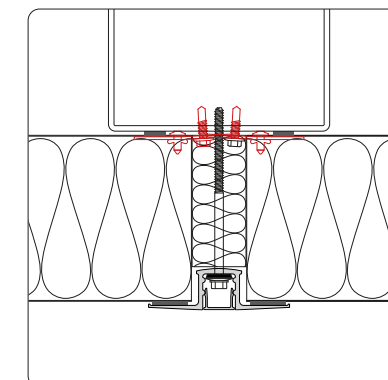


Fig. 3.7: Short screw in combination with a steel plate.

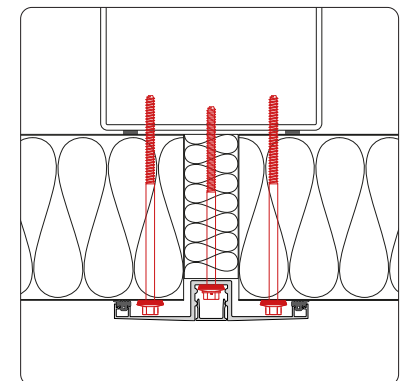


Fig. 3.4: Fastening principle A, fixing with screws.

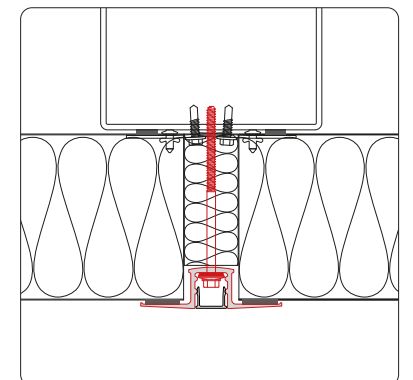


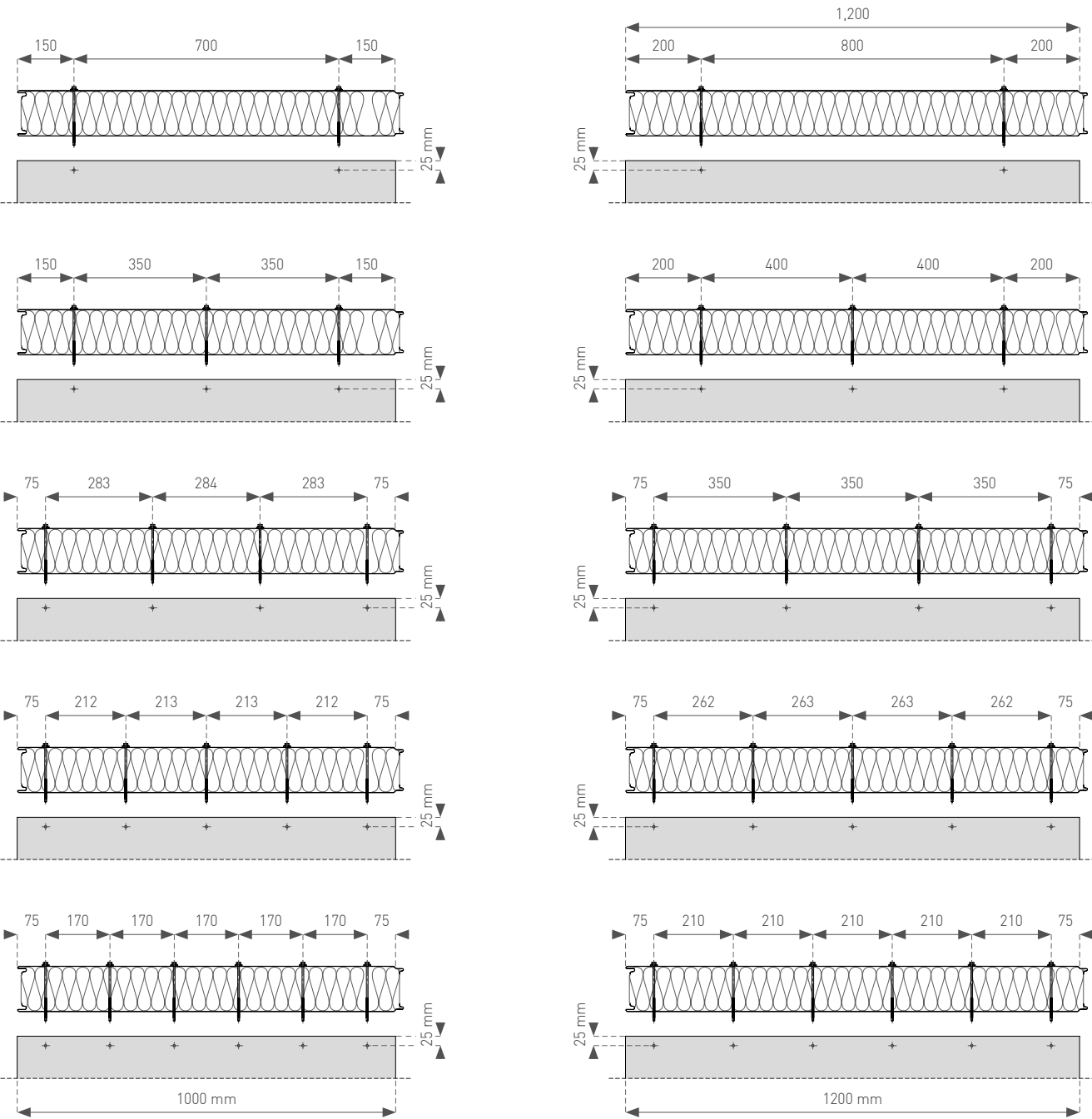
Fig. 3.5: Fastening principle B, fixing with HF 102 Aluminium profile.



C

C2.3 Fastening scheme on the panel edge

A scheme of fastening on the Trimoterm FTV panel edge for 1000 and 1,200 mm width panels is presented below. The minimum number of fasteners is 2 pcs per panel end. The fastenings are to be placed at a distance of a minimum of 25 mm from the transversal edges of the panel.





C

C2.4 Aluminium decorative & prolongation elements

Trimo decorative profiles emphasise the selected façade line, cover visible panel joints and give the building a touch of elegance. You can choose from various options manufactured from extruded and powder-coated aluminium.

Discover two types of aluminium profiles, each offering unique technical properties. All the values are stated in millimetres.

- **Prolongation aluminium profiles**
(for further information, see chapter C2)
- **Decorative aluminium profiles**

Installation of decorative aluminium profiles

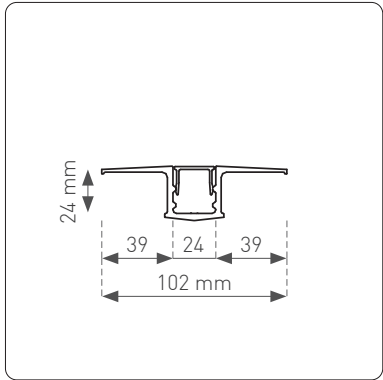
Each decorative profile consists of a support part and a cover (bottom and top part). The elements measure 6 m in length. In general, the installation procedure is the same for all aluminium decorative elements except for element HF7, where the installation procedure is slightly different due to the shape of the element support part.

For the applications listed below and other decorative aluminium element applications, see project-specific details or system design details.

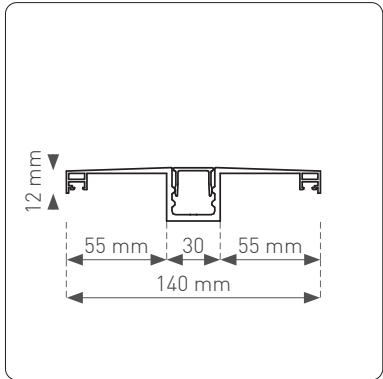
- Base detail
- Parapet wall cap
- Window framing
- Façade decoration



Trimoterm FTV system design details

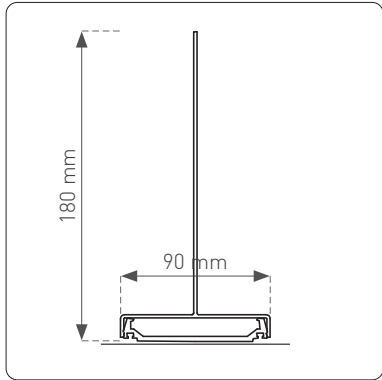


HF102 - Prolongation profile (supporting)

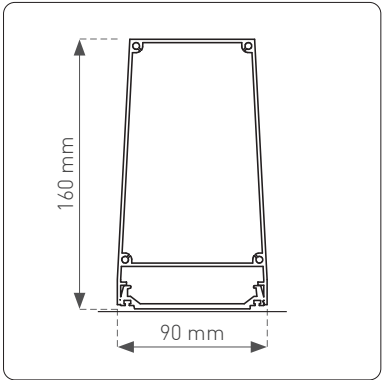


HF140 - Prolongation profile (covering)

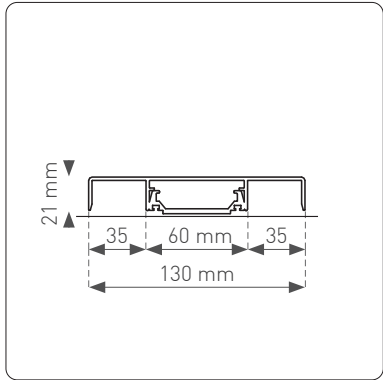
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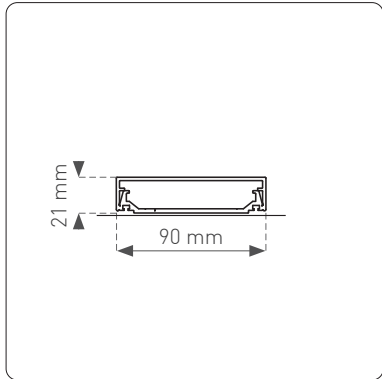
HF1 - Decorative profile



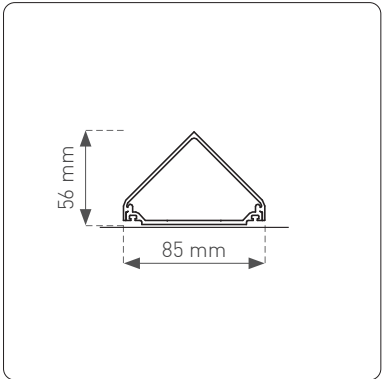
HF2 - Decorative profile



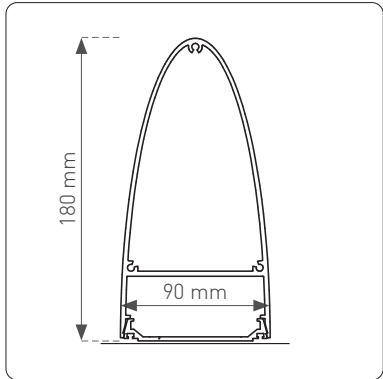
HF4 - Decorative profile



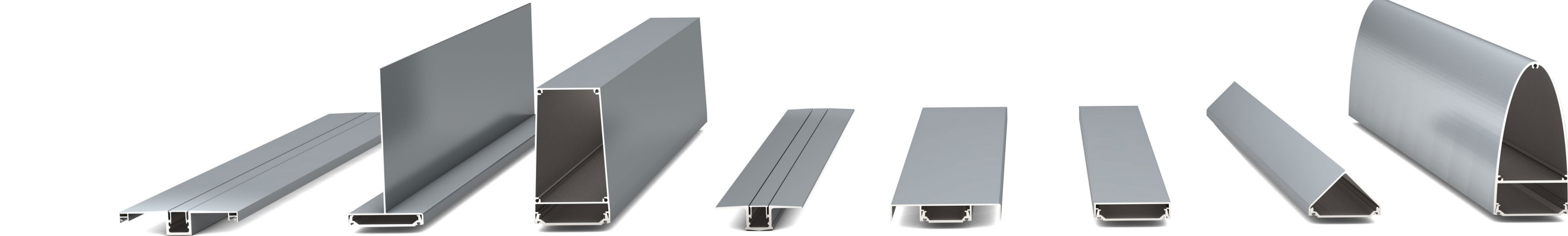
HF5 - Decorative profile



HF7 - Decorative profile



HF8 - Decorative profile





C

C3 Substructure

The substructure of Trimoterm panels plays a crucial role in the overall performance and aesthetics of the façade. It serves multiple functions, including:

1. Load-bearing capacity

Every substructure must be statically verified by a structural engineer to ensure it can support the required loads.

2. Shape

The substructure significantly influences the flatness of the façade. Therefore, it is crucial that it is manufactured within precise tolerances.

3. Appearance

The substructure is often visible from the interior and contributes to the overall interior design. As a result, it can be made in various shapes and materials to suit different aesthetic preferences.

C3.1 Types of load-bearing structure

Steel is the most commonly used material for substructures. However, substructures can also be made from concrete or wood. Depending on the chosen construction, it is essential to ensure the proper fastening of Trimoterm panels. For concrete and timber structures, an additional Fast Adjustable Levelling Substructure (FALS) is often employed to accommodate tolerances and fixing conditions.



Fig. 3.8: Steel structure within permissible tolerances



Fig. 3.9: Concrete structure within permissible tolerances



Fig. 4.0: Laminated wood structure



Fig. 4.1: Concrete structure with FALS



C

C3.2 Substructure tolerances

When installing the panels, the prescribed tolerances of the load-bearing structure must be observed (IFBS guideline PA 09 - Performance tolerance in light metal structures point 3.1.1). If these tolerances are not met, use a Fast Adjustable Levelling Substructure (FALS). See on page: 67.

1. support structure alignment

single-span system $\pm 2L / 1.000$ (L-column axis distance)
multi-span system $\pm L / 1.000$ (L-column axis distance)

2. support structure torsion

single-span system $\pm 1^\circ$ / column torsion
multi-span system $\pm 0.5^\circ$

3. axis span tolerance

columns width <200 : ± 10 mm / columns width >200 : ± 20 mm

4. column inclination tolerances

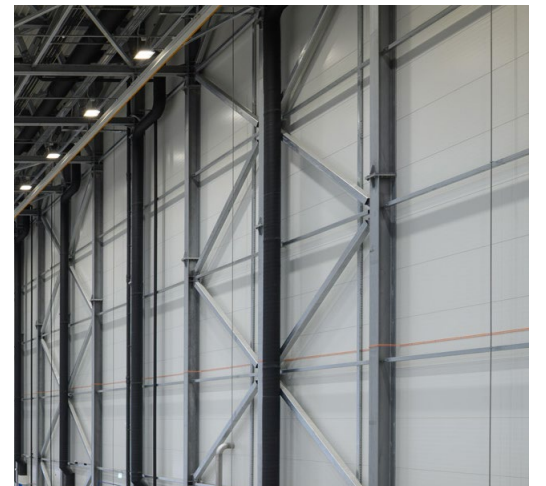
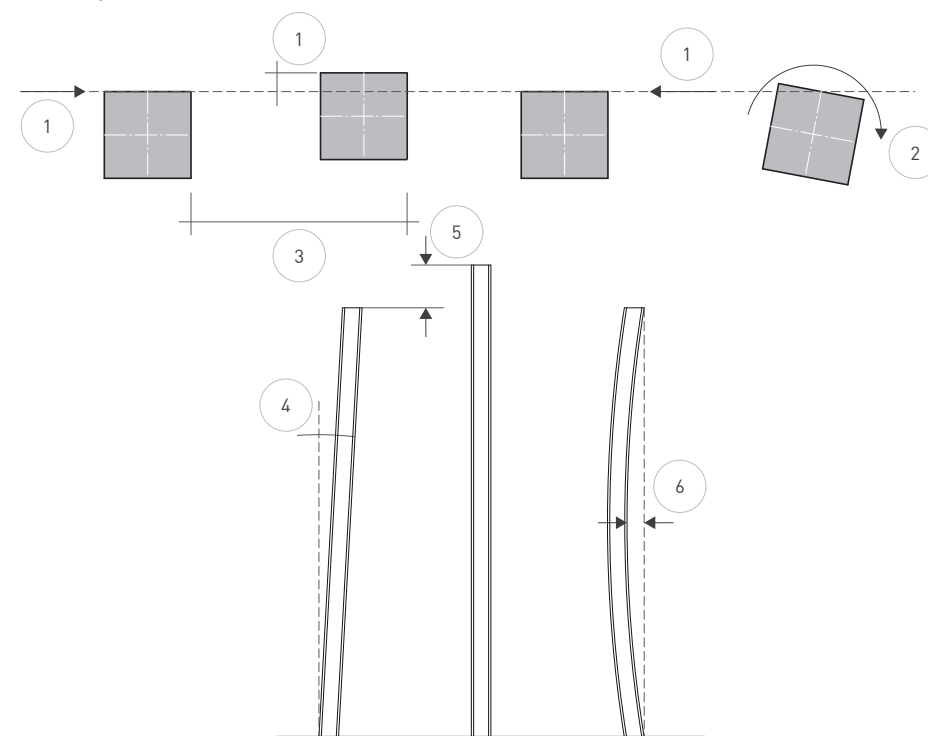
$\pm 1^\circ$

5. column height difference tolerance

± 20 mm

6. column curvature tolerance

± 10.0 mm / 10 m





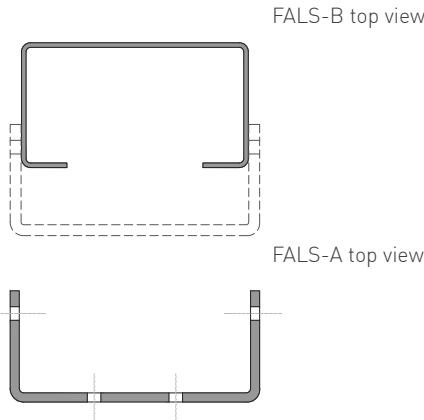
C

C3.4 Fast adjustable levelling substructure (FALS)

FALS is used to level out the main structure of the building or supporting wall in order to install the Trimoterm FTV mineral wool sandwich panel façade system.

The distances between anchor screws must be determined in accordance with a static calculation, relating to the properties of the building, wind loads, anchor type and the quality of the load-bearing structure. Support frames are fixed to the structure using certified anchor screws.

FALS components



120 / A55 / C - 4 - L120

- Length of profile FALS-A (=L120/L140)
- Thickness of profile FALS-A (= 4 or 5 mm)
- Fastening to a concrete (C) or steel (S) structure
- Height of profile FALS-B (= B55/B75)
- Width of a suitable profile FALS-B (= 120/140/160)

B55 - 2 / 120

- Width of profile FALS-B (= 120/140/160)
- Thickness of profile FALS-B (= 2 or 3 mm)
- Height of profile FALS-B (= B55/B65)

FALS

A quick mounting system

Fast adjustable levelling substructure (FALS), a quick mounting system, is suitable for use on uneven concrete or steel structures to achieve a finished level surface without additional welding or adding material to the support structure.



C

FALS offsets from the base structure

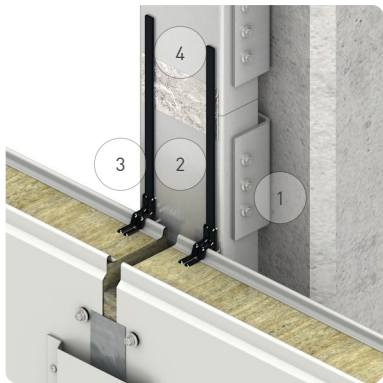
	Neutral	Minimal	Maximal
A55 / B55			
A75 / B65			
(A75 / B55)*			

* Optional
All units measured are in millimetres (mm).

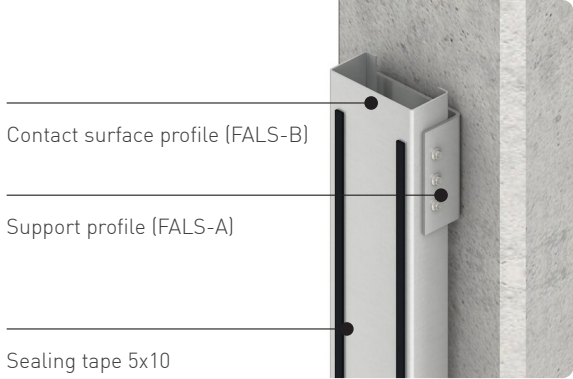
For the full FALS elements range, see the Trimo accessories catalogue.



Trimo accessories catalogue



1. Support profile (FALS-A)
2. Contact surface profile (FALS-B)
3. Sealing tape 5x10
4. Adhesive tape Alu-PET



- Contact surface profile (FALS-B)
- Support profile (FALS-A)
- Sealing tape 5x10



C

C4 System sealing

By sealing the façade envelope, we ensure airtightness and increase the energy efficiency of the building due to the associated lower heat losses.

In addition, by sealing the details properly, we prevent the retention of water in the core of the panel. This is achieved in two ways:

- By preventing the passage of water vapour from the hot to the cold side. This prevents condensation from forming in the core.
- Preventing the ingress of rainwater or other water that appears on the surface of the façade (washing or wet rooms).

Correct orientation to enable water drainage means that the tongue of the longitudinal joint must face upwards. The sealing of the Trimoterm façade is achieved by using different elements:

1. Factory applied gaskets in the longitudinal joint

All Trimoterm panels come with EPDM gaskets pre-installed in the longitudinal joint groove. The gaskets must be compressed by the tongue of the neighbouring panel. In horizontal installations, the self-weight of the panel helps achieve this compression. For vertical installations, it is recommended to use a mechanical tool to assist in compressing the panels.

2. Longitudinal sealing tape between the panel and other steel elements (substructure or flashings)

Sealing tape ensures proper sealing between the panel and the substructure, as well as between the covering flashing and the panel. These self-adhesive tapes should be installed in place before panel installation. They come in various sizes and materials. If the sealing tape is expected to be exposed to sunlight and outdoor environments, EPDM material is recommended. Otherwise, PE materials are used.

3. Mastic sealant to seal possible points of water ingress into the panel

Mastic sealant is typically applied to the panel ends at the tongue joint. Before using the sealant for the first time, perform a compatibility test on a hidden part of the panel. Handle with care to avoid staining the visible surface.

4. Flashings or HF Alu. profiles in combination with sealing tapes

Flashings or HF Aluminium profiles can serve as a water barrier and are typically installed on the outer (cold) side of the façade. In combination with sealing tapes, they are commonly used in panel prolongations and internal corners. Profile drip flashing inserted at the lower part of the joint gap allows potential water to drain.

5. Membranes and tapes

Vapour permeable elements are installed on the cold side of the façade to ensure that the system dries and to prevent moisture accumulation in the panel core. Vapour-tight elements are installed on the warm side of the façade to prevent water vapour from entering the panel core.

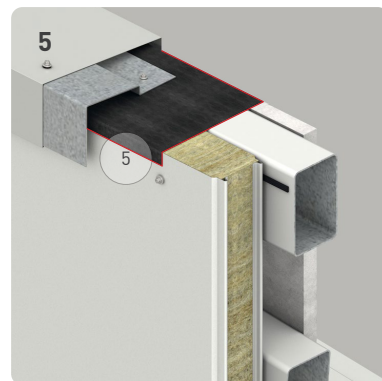


Fig. 4.2: TE-V-03.01 parapet wall sealing

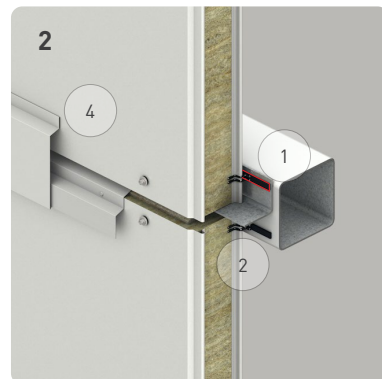


Fig. 4.3: TE-V-01.02 joint sealing elements

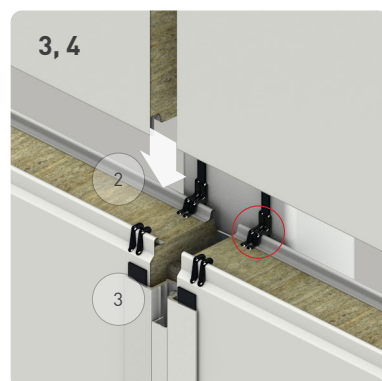


Fig. 4.4: TE-H-01.03 joint sealing elements

1. Self-adhesive sealing tape 5x10xL
2. Mastic seal
3. Fixing profile HF102
4. Prolongation with steel flashing
5. Waterproof membrane or tape
6. Profile drip flashing

C

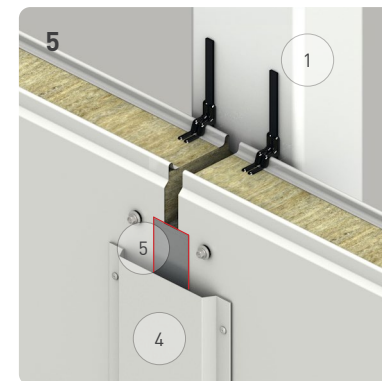


Fig. 4.5: TE-H-01.01 cut joint sealing

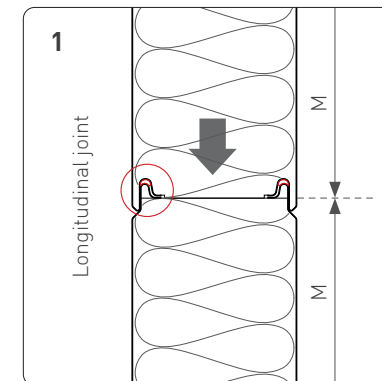


Fig. 4.8: Joint with sealing tubes compressed

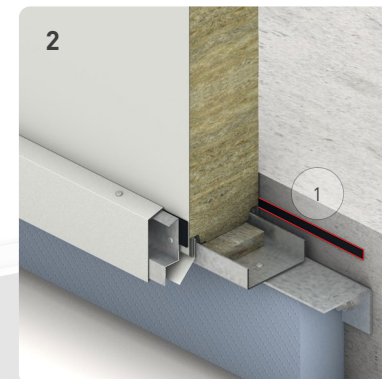


Fig. 4.6: TE-H-02.02 Joint base sealing elements



Fig. 4.7: TE-H-05.01 internal corner sealing elements

! NOTES & WARNINGS

Trimoterm façade panels must be protected from water and other liquids seeping into the insulation during unloading right through to the end of the installation.

It is the installer's responsibility to ensure that the panels are protected until the end of the installation. Trapped water/moisture in the panels can cause unfavourable internal corrosion in the panels. Panels should not be installed during snow, rain or dense fog.



C

C5 Façade panels structural design and application

The following chapter provides guidelines for the static calculation of Trimoterm FTV panels and additional façade elements. The text below presents basic information required for determining façade penetrations, spans and fastenings.

C5.1 Static calculation

Static calculation of Trimoterm FTV panels is required in accordance with applicable legislation EN 14509 and other national technical regulations for sandwich panel design. Selected panel dimensions, panel spans, the number of required fixing screws and the locations of penetrations and openings must be checked for each individual building. A panel static calculation is available from Trimo technical support.

The calculation requires the following input data:

1. Building location and data linked to location

- Location and address,
- Wind zone or basic wind speed,
- Terrain category (categories 0, I, II, III, IV),

2. Geometry and type of building

- Building shape and dimensions (height, length, width),
- Building parapet,
- Location of penetrations and openings,
- Building type (open / partially open / closed),
- Building safety class (if prescribed)

3. Panel data

- Panel thickness, width and length,
- Panel spans (single-span, multi-span),
- Panel support distances,
- External and internal steel sheet colour,
- External and internal profile types

4. Permanent loads

- Additional layers (green façade, PV modules or other decorative layers)

5. Additional input for the fastening calculation

- Type of fasteners required,
- Material and thickness of the substructure

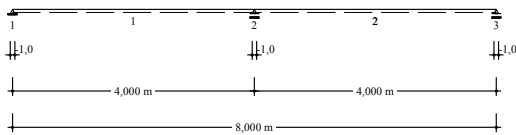


C

How to read static calculations provided by Trimo?

1. STATIC SYSTEM

1.1 SKETCH



M = 1 : 75

wall-panel of 2 spans, horizontal installation.
-1: no definition from user. The necessary support width was determined by the software.

1.2 PANEL SPECIFICATION

Sel. panel: Power T FTV MS 150 0,60 0,50 (GA Z-1224) - with k-value (outside-colour RAL 9007 = graualuminium)

Background:Gutachten Z-1224
Holder: Trimo d.d. (Trimoterm Power T - Gutachten -1224)
Design: DIN EN 14509, annex E

2.2 INTRODUCED LOADS

- | | | | |
|-------------------------------------|--------------------|---|----------------------------------|
| 1. wind pressure over entire length | w_d | = | 0,600 kN/m2 |
| 2. wind suction over entire length | w_s | = | -0,850 kN/m2 |
| 3. summer temperatures for SLS | ϑ_{outs} | = | +63°C, ϑ_{ins} = +25°C |
| 4. summer temperatures for ULS | ϑ_{outs} | = | +80°C, ϑ_{ins} = +25°C |
| 5. winter temperatures | ϑ_{outs} | = | -20°C, ϑ_{ins} = +20°C |

4.4 COMPRESSION STRESSES AT SUPPORT

The design of the compression stresses at the supports is carried out for each support with the decisive design procedure (ultimate limit state, serviceability limit state, constructive demands).

support	$\gamma * A_s^{(1)}$	$\gamma * A_t^{(2)}$	exist. $b^{(3)}$	$A_{SLS,d}^{(4)}$	$A_{ULS,d}^{(5)}$	req. $b_s^{(6)}$	req. $b_t^{(7)}$	req. $b^{(8)}$	req. $b_{dec}^{(9)}$
[-]	[kN/m]	[kN/m]	[cm]	[kN/m]	[kN/m]	[cm]	[cm]	[cm]	[cm]
1	1,54	1,80	-1,0	5,43	4,54	(0,1)	(0,1)	4,0	4,0
2	3,97	3,60	-1,0	9,55	7,98	(0,1)	(0,1)	6,0	6,0
3	1,54	1,80	-1,0	5,43	4,54	(0,1)	(0,1)	4,0	4,0

4.6.2 Design of tensile forces

The number of the required/chosen fasteners rely on the panel-width. Close attention must be paid to requirements of the basic calculation principle (screw-distance and -number etc.)!

panel-width:1000 mm in accordance with explicit user definition

support									
no	variation	material	tAA	asym.	Qty.	chosen fasteners	N_{sd}	N_{Rd}	util.
-	-	-	[mm]	-	S/EL	-	[kN]	[kN]	
1	visible	S235	3,00	x	3	JT3-D-6H-5,5/6,3 x L (O19) ¹⁾	2,97	4,94	60,0%
2	visible	S235	3,00		5	JT3-6-5,5 x L (O16) ²⁾	7,63	8,67	88,0%
3	visible	S235	3,00		2	JT3-6-5,5 x L (O16) ³⁾	2,97	3,47	85,5%

explanations

asym. [x] - thin-walled und asymmetric sub-construction (e.g. Z- or C-shaped profiles).
LSP - load spreading plate

- 1) 3 × EJOT JT3-D-6H-5,5/6,3 x L (O19) w/ washer ETA-13/0177 ANX.5
2) 5 × EJOT JT3-6-5,5 x L (O16) w/ washer ETA-13/0177 ANX.16
3) 2 × EJOT JT3-6-5,5 x L (O16) w/ washer ETA-13/0177 ANX.16

1. INPUT DATA

a. Static system and panel selection

This section provides details about the static system used for the analysis, including the panel length and the positions of the supports. The panel specifications chapter contains all the relevant information about the selected panel.

1. INPUT DATA

b. Considered loads on the panel.

This section outlines the design loads applied to the panel.

2. RESULTS

a. Required minimum support widths

The minimum support width for each support is specified in centimetres. Please refer to the right column of the table for these values.

2. RESULTS

b. Fasteners

This section details the type and number of screws selected for each support, as well as the thickness and type of the substructure.



C

Design tables of allowable spans

To assist in the pre-selection and design of Trimoterm FTV panel façades, a table of allowed spans and minimum support widths for construction has been produced.

The data in these tables is intended for informational purposes only. The exact span between the supports must be calculated individually for each project.

According to standard EN14509, a min. support width of 40 mm is required for end supports and 60 mm for intermediate supports, unless a wider support is necessary. The required support width for each project is determined by static calculations.



Trimoterm structural design data document



C

C5.2 Additional façade elements installation

Additional façade elements in modern architecture have protective, environmental, commercial or aesthetic purposes. They can be installed in the forms of blinds, lights, security cameras, signs, advertisements, decorative elements, etc.

Starting points:

- **The options demonstrated applies to the external sheet thickness $t = 0.70$ mm.**
- It is necessary to ensure the most even distribution of additional equipment weight to the element.
- It is necessary to use min. 2 fasteners/equipment
- The minimum distance of screws/rivets from the edge of the panel and the minimum distance between screws/rivets needs to be more than 100 mm.
- The stated starting points apply to static loads. Fastening equipment causing dynamic loads is not allowed.
- Vertical load needs to be taken into account in the panel's design stage.
- Long consoles increase the pull-out forces on screws and rivets. Therefore, it's necessary to perform additional checks on the fasteners.

! NOTES & WARNINGS

External loads can affect panel behaviour during a fire. Consult a fire engineer about any additional façade elements when fire resistance is required.

Higher loads shall be distributed to more panels, supported with profiles, and translated to the load-bearing structure.

In any case, follow the installation instructions of the supplier of the additional façade element.



C



Fastening to the external steel sheet

Weight of additional equipment 0 - 30 kg

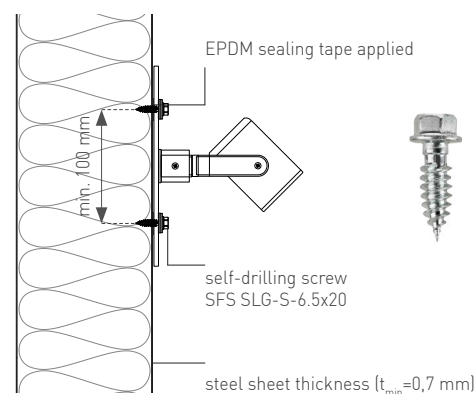


Fig. 4.9: Fastening with screws.

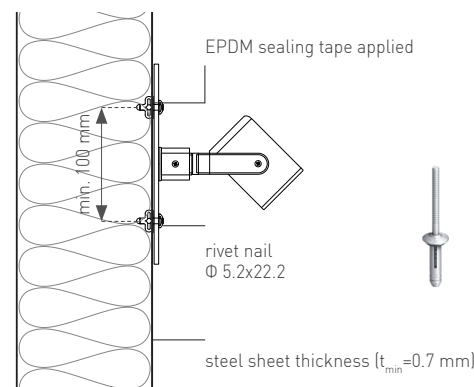


Fig. 5.0: Fastening with rivets.

Fastening through the element

Weight of additional equipment 30 - 50 kg

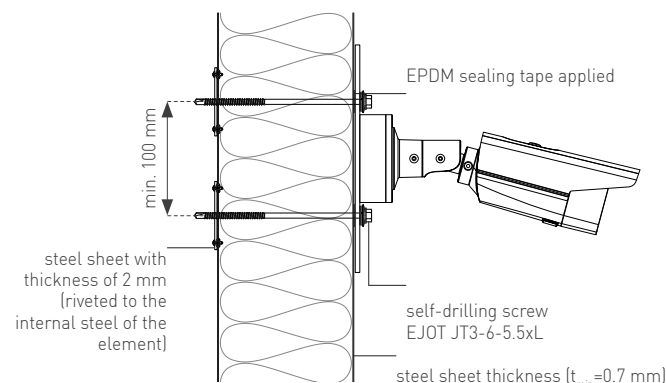


Fig. 5.1: Fastening through the panel to a 2 mm steel sheet with screws.

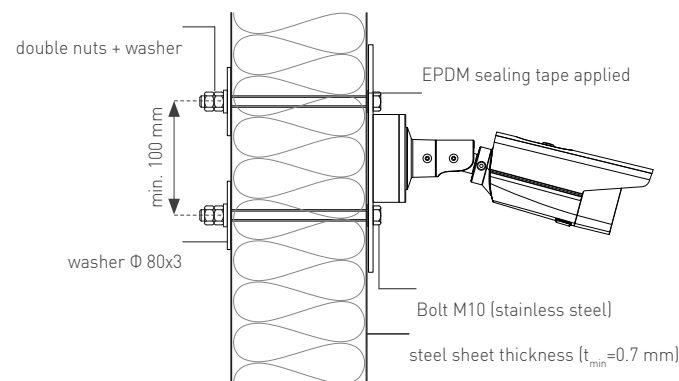


Fig. 5.2: Fastening through the panel with M10 bolts (stainless steel).



C

C5.3 Panel penetrations

In the building industry, penetrations are common. Trimoterm FTV sandwich panels can accommodate various cut-outs for pipes, windows or doors. The guidance is consistent for both horizontal and vertical installation. Panels are delivered as full modules and must be cut on-site before installation using tools for “cold” cut-outs.

A.

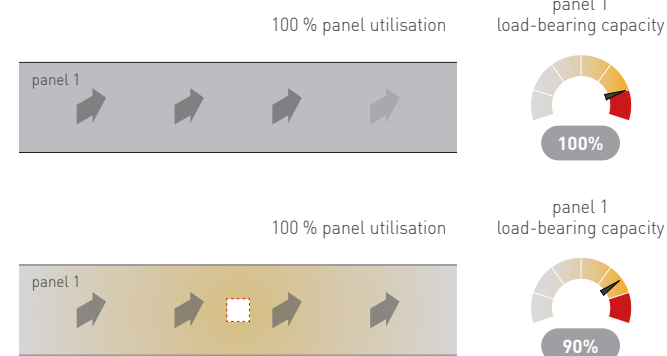
The Trimoterm FTV panel can withstand openings without any additional reinforcement, as long as the utilisation of the panel's load-bearing capacity is not exceeded.

B.

When panel utilisation exceeds the panel capacity, it is possible to transfer the excess amount to the adjacent panels.

If adjacent panels are also fully utilised, additional substructure is required to transfer the load directly into the structure.

A.



B.

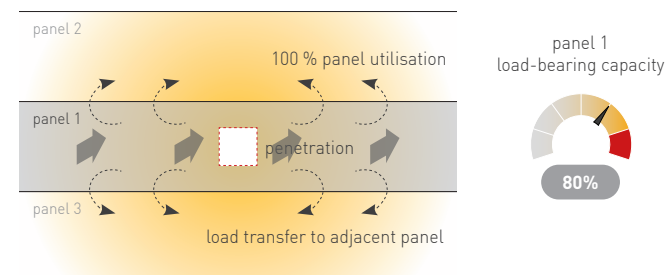


Fig. 5.3: Example of load distribution on a penetrated panel



C

Additional loads must be considered when sizing the adjacent panels. For load transfer factors, see the instructions below.

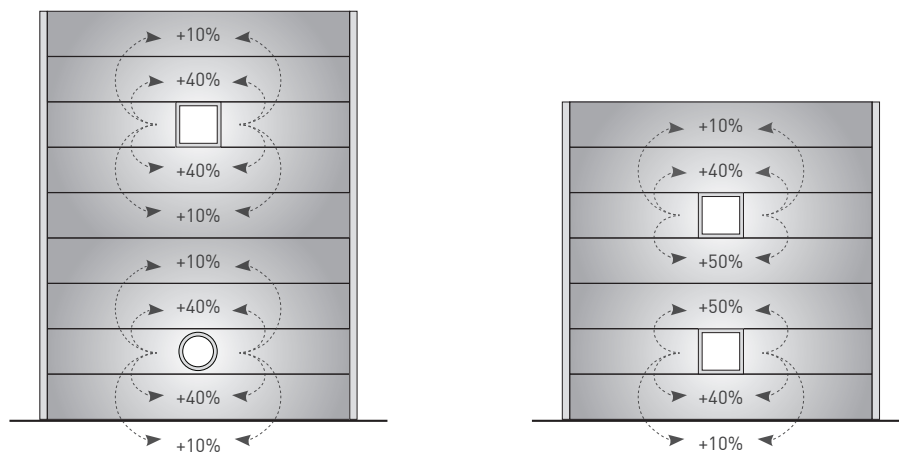


Fig. 5.4: Load transfer of a weakened panel to adjacent panels

Individual calculations for penetrated panels require additional data:

- Panel location on the façade,
- Cut-out size,
- Cut-out position on the panel.
- Geometrical form of the opening

For more, see:



Trimoterm fire application document

**! NOTES & WARNINGS**

The impact of an opening on the load-bearing capacity depends on its size and location on the panel. Therefore, we perform individual calculations for each project situation.

All support elements must be structurally checked regarding the project situation.

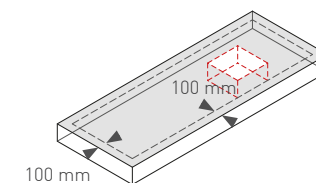


C

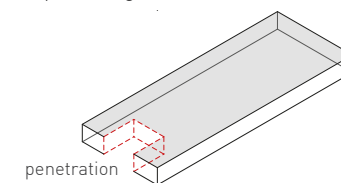
Recommended penetration positions

Some locations for penetration openings on the panel are more convenient than others. Therefore, it is essential to follow the guidance below when designing façade or installation penetrations.

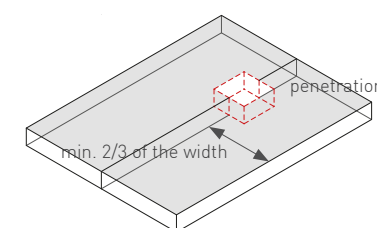
1. Further than 100 mm from the panel edge.



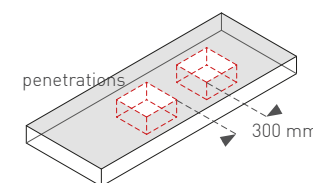
2. Aligned with the panel edge (modules > 1000 mm).



3. Central to the joint (2/3 of panel width must be intact).



4. Between penetrations min. 300 mm

**! NOTES & WARNINGS**

The recommendations shall be used as information regarding possible principles for penetration system solutions on Trimoterm panels. Real cases need to be discussed individually with Trimoterm technical support.

Fire resistance of penetration system for cables, pipes, ventilation ducts, etc. is under the full responsibility of the 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.



C

C6 Design tools and panel specification

C6.1 BIM & CAD Libraries

We provide support with advanced design tools for AutoCAD, Revit and Archicad, specifically developed to facilitate the seamless integration of Trimoterm products into your projects.

Our 2D and 3D Trimoterm product models, complete with all necessary parameters for both design and production phases, simplify and improve your design process.

We invite you to explore these innovative tools and elevate your design capabilities. Visit Trimoterm's website to download the libraries and begin integrating Trimoterm products into your projects today.

C6.2 Details

Our extensive library of Trimoterm details is designed to address all the challenges of your project. Each detail is available in both PDF and DWG formats.

We invite you to explore and download these comprehensive details. Visit Trimoterm's website.



www.trimo-group.com/en

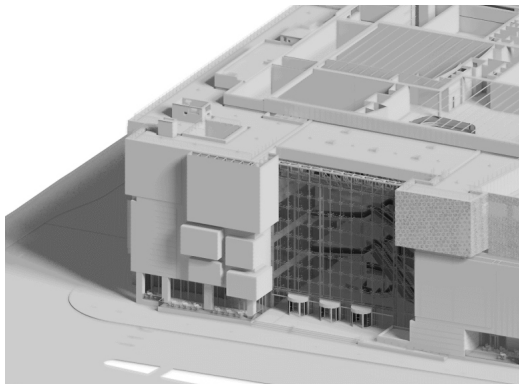
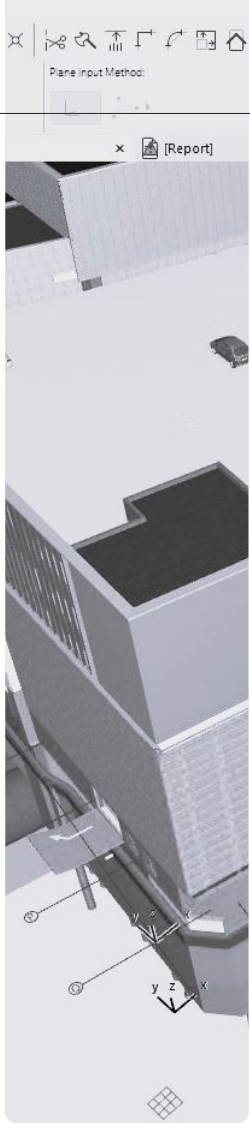
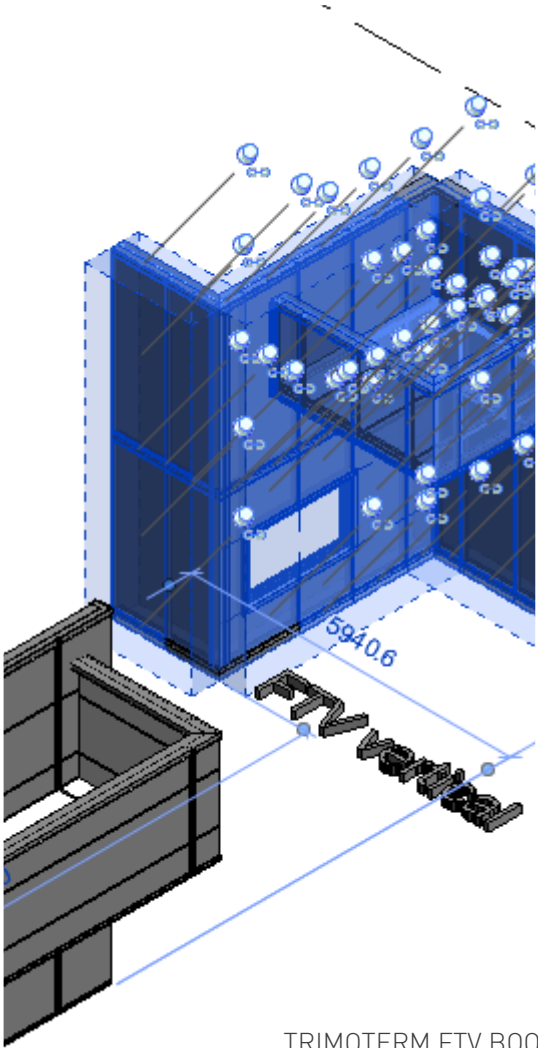


Fig. 5.5: BIM model including Trimoterm library panels.



www.trimo-group.com





C

C6.3 Specification of façade system

Trimoterm FTV cutting list is a tool, which helps you order Trimoterm FTV panels. By choosing specific variation of the panel, the tool gives you visual feedback so you can easily make your selection. When inserting different dimensions of the panels, a tool warns you if any Trimoterm technical limitations are not met.

Cutting list requirements

By using the form, the client can communicate the information needed for production more easily and quickly. As a result, the following set of ordering data is more complete and clear:

- Number of panels,
- Thickness of the façade elements,
- Length of panels,
- Module - M (width),
- Panel core type,
- Panel coating type,
- Panel colour for side A and B,
- Panel profile type,
- Dimensions of FTV sharp-edge L-shape corner,
- Dimensions of FTV round-edge L-shape corner,
- Dimensions of FTV round-edge U-shape corner.



Trimoterm FTV cutting list



Trimoterm abbreviations

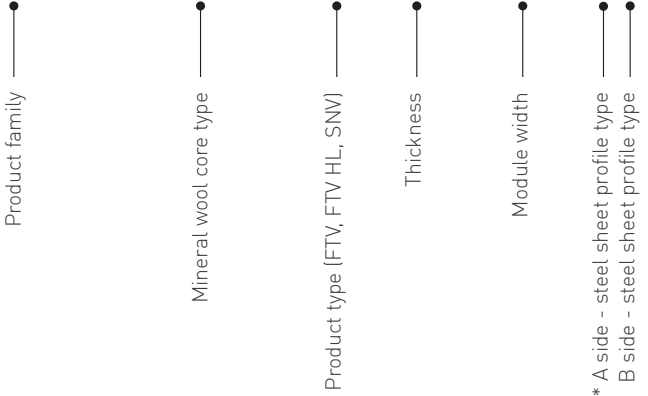
The general abbreviations principle follows the rule of the first letter of the name. An example of an abbreviation can be seen below. The rule applies to all Trimo portfolio products.

- (T) Element, panel thickness
- (t) Thickness of a steel sheet
- (M) Module width
- (R) Design length, raster
- (L) Panel length

Trimoterm FTV panels are marked using the resulting scheme:

Trimoterm Power T FTV-60/1000 MS
External steel sheet:
0.55 mm SP 25 µm ANTHRACITE
Internal steel sheet:
0.50 mm SP 25 µm GREY WHITE

Trimoterm Power T FTV-60/1000 MS



* Side A is usually the external side of a panel.

Trimoterm details are marked using the resulting scheme:

TE-H-01.02





D Service and support



D

D1 Project consulting

From the initial idea to the final implementation, Trimo's expert team supports you at every phase of your project, from planning and architectural design to construction and handover.

Design

Trimo's design team comprises architects, designers, structural engineers and design and project managers who collaboratively create design plans and drawings, understanding the customers' needs and expectations.

Technical support

Trimo's technical support team provides comprehensive assistance throughout the entire duration of the project. This includes visualisations, detailing, BIM engineering, virtual reality, structural calculations, changes and resource management.

Material sampling

To give customers a taste of what to expect, Trimo can send metal swatches or small samples of façade products upon request.

Tender service

Trimo offers technical services to assist architects, engineers, specifiers and installation contractors in fulfilling the required specifications.

On-site instructions

Trimo's field service engineering team provides contractor training on product installation and advice on mechanical handling solutions.

Video, samples & mock-ups

Trimo effectively showcases ideas by creating visual and static representations of products, services or concepts.

Snack and learn office presentation

Trimo offers short, training-focused programmes during attendees' lunch breaks.



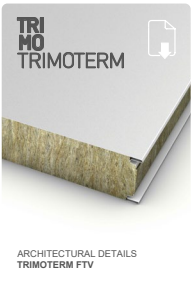
Contact us at: technical@trimo-group.com



D

D2 Trimoterm associated documents

This chapter contains all the relevant technical documents for additional information on Trimoterm panels. These documents include structural design data, technical specifications, guidelines and other resources that are essential for a comprehensive understanding of the subject. Further information about the panels can be found on Trimo's website.



Insulated
façade system -
Trimoterm FTV



Fire-resistant
internal wall
system -
Trimoterm FTV



Backing wall -
insulated
façade system -
Trimoterm FTV



Foogiene - food and
hygiene internal
wall system -
Trimoterm FTV



Flat roof system -
Trimoterm FTV



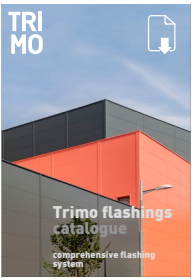
Internal wall
system -
Trimoterm FTV



Trimoterm
technical
specifications



Trimoterm
structural design
data



Trimo flashing
catalogue



Trimo accessories
catalogue



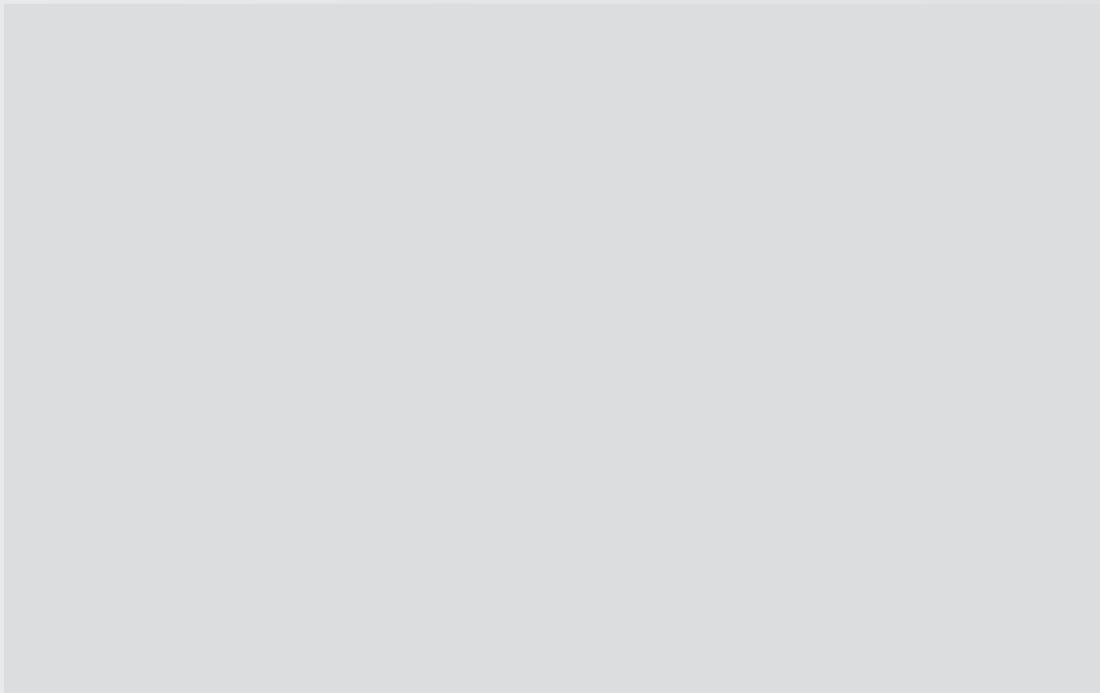
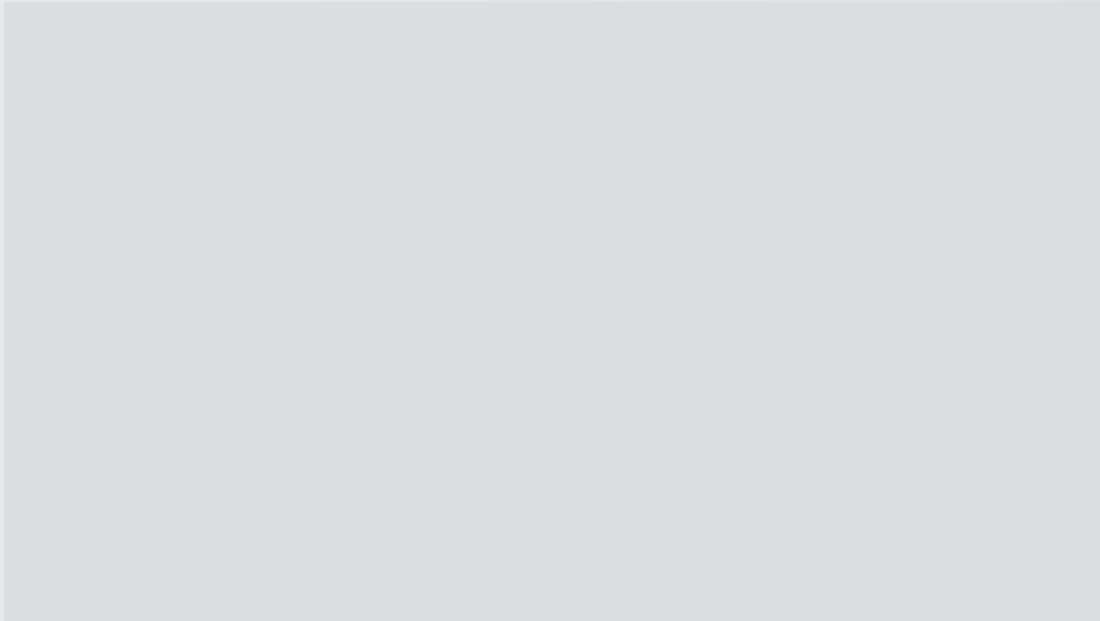
Instructions for
use / gripper for
Trimoterm panels



Packaging,
transport and
storage for Trimo
products

D2.1 Additional resources and sources

- Marco Imperadori (2024), Building with stone wool insulated sandwich panels Building, ROCKW00L, Paris, France
- J.M. Davies (2001), Lightweight sandwich construction, Manchester, The University of Manchester, UK
- Egan, J. (1998) Rethinking Construction: Report of the Construction Task Force, London



E Other applications

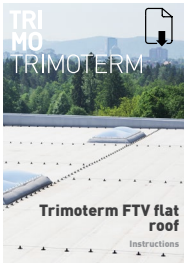
E1 Other applications documents

Trimoterm sandwich panels can be used to build: external walls, internal walls, ceilings and roofs. They are widely applied in the construction of, among other things:

- Industrial production, commercial and storage halls,
- Partition walls
- Office and service complexes,
- Container skins,
- Agricultural and food industry facilities,
- Coldrooms and freezerrooms,
- Roofs.

While this product book provides comprehensive details on the properties and installation of Trimoterm sandwich panels for façades, these versatile panels can also be used in various other applications. Whether you're looking to install them as ceilings, flat roofs, internal walls or fire walls, Trimoterm panels offer robust solutions for diverse construction needs.

For detailed technical solutions and requirements for specific applications, please refer to the individual documents listed below. These documents will guide you through the necessary additional specifications and considerations for each unique application.



Trimoterm FTV flat roof instructions

This document provides instructions for the application and installation of Trimoterm FTV sandwich panels within a flat roof system.



Trimoterm fire application

This document provides guidelines for fire-rated ceiling applications, detailing self-supporting systems, construction options and installation requirements.



Trimoterm base backing-wall application

Coming soon.



Trimo green and PV facades application

An overview of Trimo's sustainable façade solutions for energy-efficient building design.



Trimoterm NEXT panel with lower carbon footprint

This document outlines the company's commitment to sustainability, highlighting the product Trimoterm NEXT, which reduces carbon emissions in construction through the use of sustainable materials.



Technical terms - Index

The technical terms in all Trimo technical documents are harmonised with the ISO/ICS standard; Building and civil engineering vocabulary with the exception of when a technical term describes a unique element used within the façade or roof product system.

Specific technical terms can be found in the corresponding product books in the index chapter. Terms are organised in alphabetical order.



A

- Airborne sound insulation 22, 24
- Allowable spans 72
- Aluminium profile 56
- ArtMe 3, 5, 7, 48
- B**
- BIM & CAD libraries 3, 78
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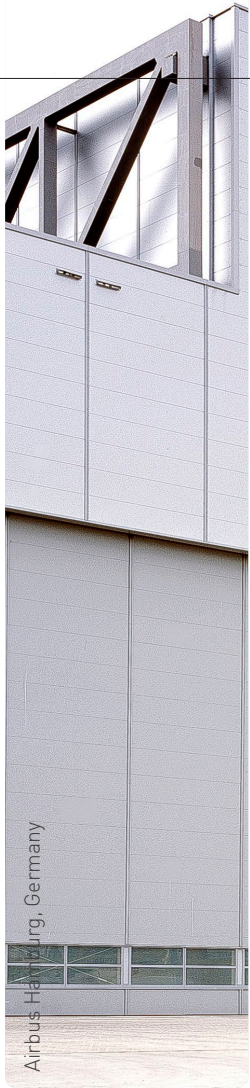
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HEADQUARTERS

TRIMO D.O.O.

PRIJATELJEVA CESTA 12,
8210 TREBNJE, SLOVENIA

T: +386 (0)7 34 60 200

F: +386 (0)7 34 60 127

TRIMO@TRIMO-GROUP.COM

WWW.TRIMO-GROUP.COM

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