

Cut-to-size façade strips: in overlap on wooden supporting structure

Ventilated façade

1 General

These application instructions are specifically intended for the fastening of cut-to-size façade strips as outside wall cladding on a ventilated and insulated wooden structure. A number of basic principles are given that must be adhered to. For variations or additional advice one can always contact EURO PANELS OVERSEAS N.V..

Overlap sidings are not treated here. For this purpose we refer to the application instructions of CEDRAL.

2 Cladding material

The following EURO PANELS OVERSEAS N.V. products are treated in this document:

• ETER-COLOR	8 mm
• TEXTURA	8 mm
• NATURA	8 mm
• PICTURA	8 mm
• NATURA PRO	8 mm
• OPERAL PRECUT STRIPS	9 mm

ATTENTION: application in overlap is not allowed for OPERAL STANDARD SHEETS

Product data and processing information can be found in the product information sheets, available from EURO PANELS OVERSEAS N.V..

When sawing NATURA and NATURA PRO, the sawed edges must be impregnated with LUKO (a transparent impregnating agent) to minimize local colour differences due to moisture absorption.

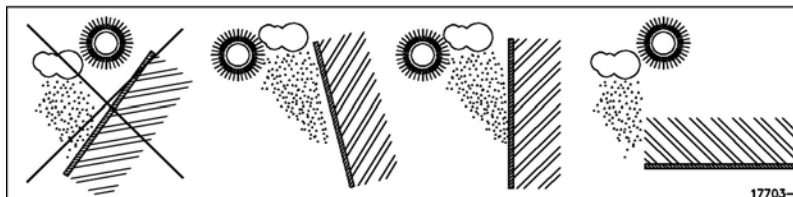
3 Area of application¹

These instructions apply for buildings up to a certain height and subjected to a maximum actual wind load in a certain wind zone. The maximum intermediate distance of the supporting structure is determined in relation to the occurring wind load taking into account a safety factor. The table below only shows non-binding reference values for the wind loads. The exact values can be found in the standards NBN B 03-002-1; NEN 6702:2001 and NBN-EN 1991-1-4.

Location	Building height	Middle area façade		Edge area façade and single span	
		Max. actual wind load	Max. center-to-center distance supporting laths	Max. actual wind load	Max. center-to-center distance supporting laths
Wind zone	m	N/m ²	mm	N/m ²	mm
Land	0-10	650	600	1000	500
Land	10-20	800	600	1200	500
Land Coast	20-50 0-20	1000	500	1500	400

The width of the edge area amounts to at least 1 m from the corner of the building and must be further determined on the basis of prevailing national standards and conditions. If variations of the aforementioned load limits occur (e.g. due to certain location or form factors, etc.), the design must be determined by building services engineers.

When the façade panels are exposed to weather conditions (rain, sun) they may only be assembled on a vertical or leaned over supporting structure. For ceiling applications reference is made to the relevant application guidelines.



¹ These instructions are only valid for applications in Europe, for applications outside this territory the Technical Service Centre of EURO PANELS OVERSEAS N.V. should be consulted.

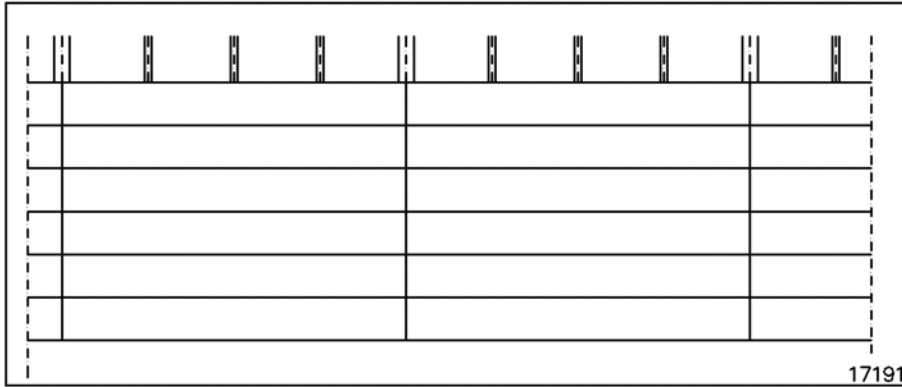
Cut-to-size façade strips: in overlap on wooden supporting structure

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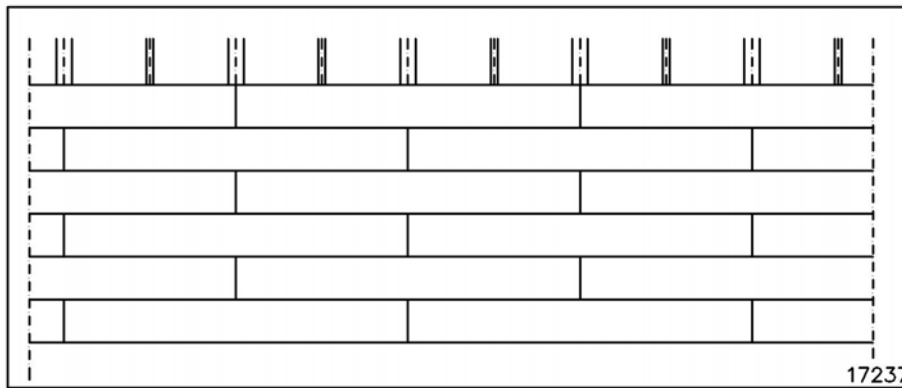
4 Patterns with cut-to-size façade strips

The following patterns are possible.

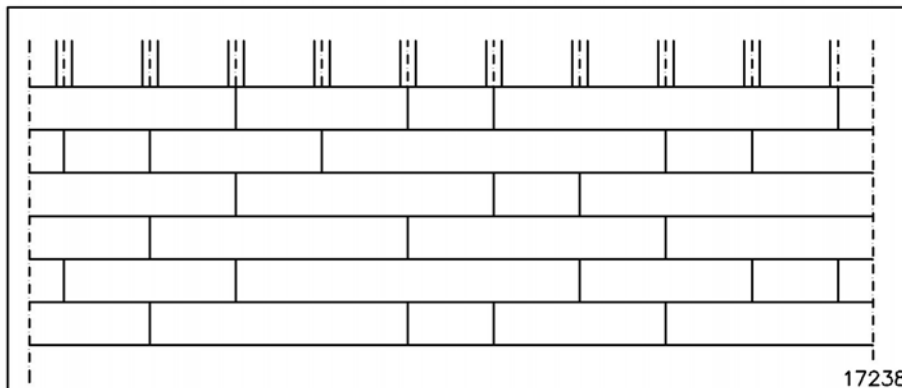
- Straight pattern



- Semi pattern



- Free pattern



Cut-to-size façade strips: in overlap on wooden supporting structure

5 Supporting structure

The EURO PANELS OVERSEAS N.V. cut-to-size façade strips are fixed on vertical wooden supporting laths (VENTISOL-LAT). The vertical supporting laths are fixed at a certain distance (depending on the required insulation thickness and air cavity) on the back construction by means of adjustable brackets or horizontal wooden cross laths.

The supporting structure must be able to resist the wind forces exerted on the building and the load of its own weight.

- maximum buckle under the influence of strain : $\leq \text{span}/300$
- safety factor calculation of strength : 3

The quality of the wood must suffice with regard to that described in the prevailing standards for this area of application. The wood must also be protected against being affected by fungi, etc. in accordance with the prevailing standard.

- minimum characteristic bending strength of wood : 18 N/mm²
- minimum average modulus of elasticity : 9000 N/mm²

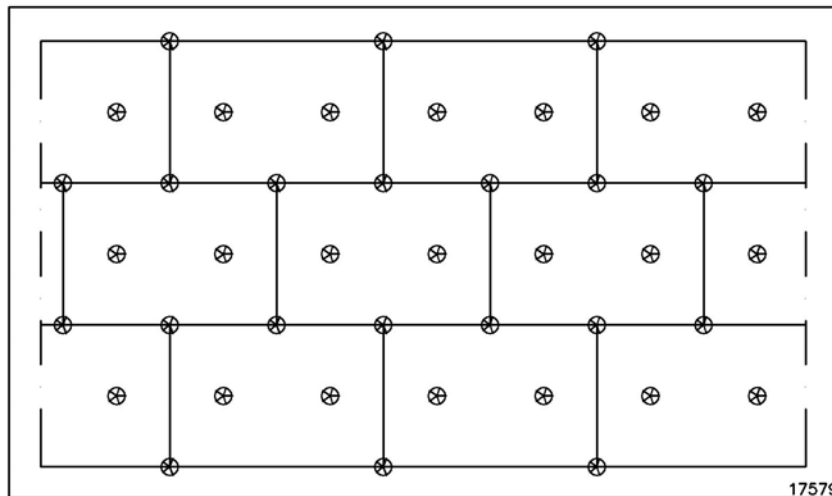
The fastening of EURO PANELS OVERSEAS N.V. façade panels must always take place with a ventilated cavity. The necessary openings are provided on the bottom side, top side and in the details to allow sufficient ventilation.

Badly ventilated façade panels could result in physical problems for the construction and differences in colours under influence of humidity for panels with a semi-transparent coating.

- ventilation openings above/below : $\geq 10 \text{ mm/m}$ or $100 \text{ cm}^2/\text{m}$

Building height	0-10 m	10-20 m	20-50 m
Minimum cavity width	20 mm	25 mm	30 mm

Mineral wool with a water-repellent black protective coating is recommended for insulation. The insulation is fixed with synthetic insulation fastenings. The insulation is fastened according to the instructions of the producer of the insulation, e.g. with five insulation fasteners per square meter.



If the wooden supporting laths are fixed with brackets, the insulation is fastened after the fitting of the brackets and before the fitting of the wooden supporting laths. A slit is cut in the insulation at the bracket.

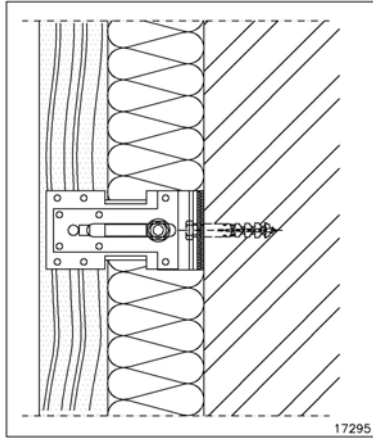
It is preferable to isolate the bracket from the supporting wall by placing a piece of hard insulation material (THERMOSTOP) between the supporting wall and the bracket.

If the wooden supporting laths are fixed on horizontal wooden cross laths, the insulation is placed in between the horizontal cross laths before fixing the wooden supporting laths.

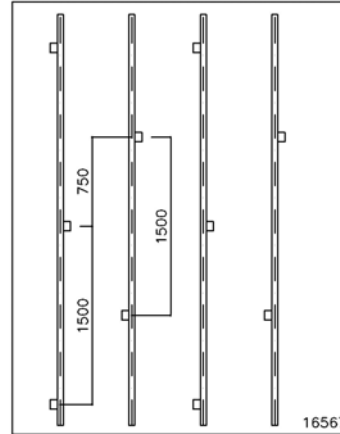
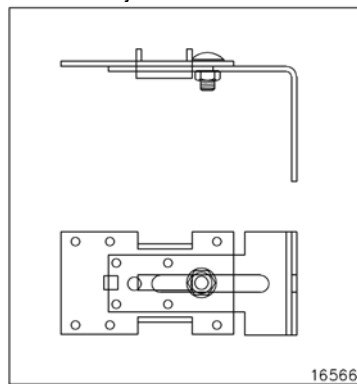
Cut-to-size façade strips: in overlap on wooden supporting structure

VARIANT 1: INSULATION BETWEEN ADJUSTABLE BRACKETS

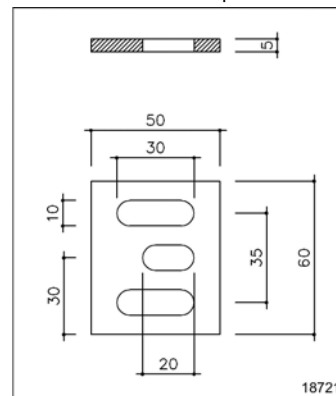
With uneven back constructions the vertical wooden supporting laths can be fixed using adjustable brackets. Corner brackets are available on request for the corners.



Adjustable bracket



Thermostop



The supporting lath is sufficiently thick to enable the good fix of the brackets, and the adjustable bracket has the following properties.

- minimum thickness supporting lath : 50 mm
- bracket material : at least Sendzimir galvanised steel
- continuous remote control : 60 - 120 mm (back construction - rear lath)

The fixing of the adjustable brackets to the back construction is individually determined for each project depending on the nature and the state of the wall to be cladded.

In general a minimum pull-out value per fixing point of 3 kN (300kg) is recommended. This must however be verified for each project. For concrete and solid brick a stainless steel wood screw (min. 7 mm diameter) with a hexagonal head and associated nylon plug is used. The screws with hexagonal head are, however, not tightened too firmly so thread in the nylon plug is not damaged.

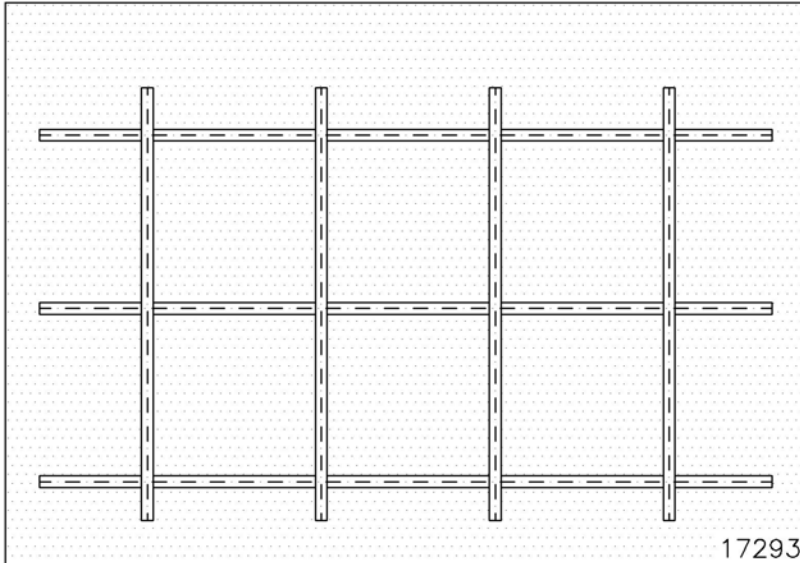
For other surfaces (hollow brick, cellular concrete, system walls, etc.) suitable fastening means must be used to be able to accommodate the tractive force occurring as a result of the wind load and the shearing forces as a result of the own weight. If necessary a pull-test must be conducted on site. The supporting laths are to be fixed to the adjustable bracket by means of four stainless steel wood screws per bracket. The screws must penetrate at least 25 mm in the supporting lath.

To obtain a stable supporting structure, the adjustable brackets are alternately placed to the left and the right of the supporting lath. The brackets of two supporting laths located next to each other are also fitted staggered.

Cut-to-size façade strips: in overlap on wooden supporting structure

VARIANT 2: INSULATION BETWEEN HORIZONTAL CROSS LATHS

For timber frame constructions or sufficiently smooth back constructions, the insulation is placed between horizontal wooden cross laths to which the vertical supporting laths are fixed.



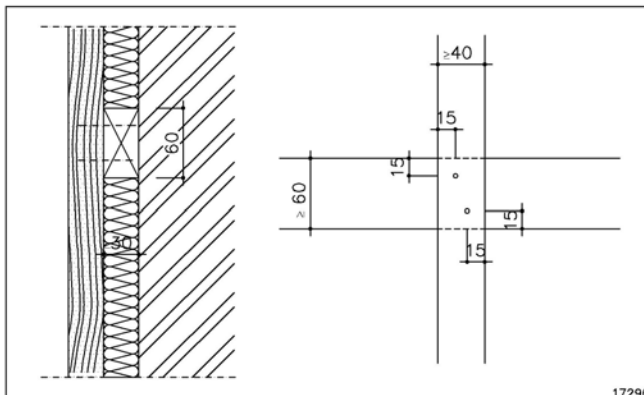
The fixing of the horizontal cross laths to the back construction is individually determined for each project depending on the nature and the state of the wall to be cladded.

In general a minimum pull-out value per fixing point of 3 kN (300kg) is recommended. This must however be verified for each project. For concrete and solid brick a stainless steel wood screw (min. 7 mm diameter) with a countersunk head and nylon plug is usually used. The screws are, however, not tightened too firmly so thread in the nylon plug is not damaged.

For other surfaces (hollow brick, cellular concrete, system walls, etc.) suitable fastening means must be used to be able to accommodate the tractive force occurring as a result of the wind load and the shearing forces as a result of the own weight. If necessary a pull-test must be conducted on site.

The vertical supporting laths are fixed to the horizontal wooden cross laths by two stainless steel wood screws per crossing point.

- minimum width of horizontal cross lath : 60 mm
- minimum thickness of horizontal cross lath : 30 mm



VERTICAL WOODEN SUPPORTING LATHS

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The vertical wooden supporting laths are planed on one side and aligned in the same plane when placing to obtain sufficient evenness. The wood must also be sufficiently stable so that alignment is retained. A small expansion joint is left between the wooden supporting laths.

- maximum unevenness : $\leq L/1000$
- joint between supporting laths : $\geq 5\text{mm}$

The wooden supporting laths are placed vertically so that penetrating or condensation water can run down from the back of the panel (and does not stagnate on the wooden laths). The design plan of the façade cladding shows the supporting laths.

The wooden supporting laths must be sufficiently wide for sufficient water sealing and the correct fitting of the fastening accessories. At vertical joints it is recommended to use slightly wider wooden supporting laths than the minimum width to be able to accommodate tolerances in alignment (and therefore avoid "air screws").

Fastening	glue
Minimal width supporting lath without joint	$\geq 40\text{ mm}$
Minimal width supporting lath with joint	$\geq 100\text{ mm}$
Advised width supporting lath with joint	100 mm

The vertical supporting laths must be sufficiently thick to resist occurring forces and to enable the correct application of the fastening accessories.

Fixing of the supporting laths with adjustable brackets

- Minimum thickness of supporting laths : 50 mm
- Maximum distance between brackets : maximum 1500 mm

Fixing of supporting laths on horizontal cross laths

Distance between horizontal cross laths	Minimum thickness of the vertical supporting laths
600 mm	$\geq 30\text{ mm}$
800 mm	$\geq 35\text{ mm}$
1000 mm	$\geq 40\text{ mm}$
1200 mm	$\geq 45\text{ mm}$
1500 mm	$\geq 50\text{ mm}$

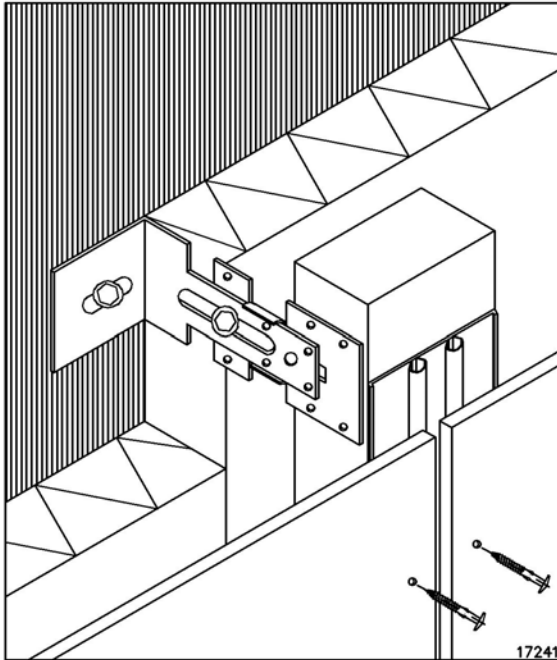
APPLICATION PROCEDURE

The following procedure can be used for the fitting of cut-to-size façade strips on a wooden supporting structure.

1. Check the straightness of the wooden laths
2. Use the façade cladding design plan to mark off the centre to centre distances between the supporting laths on the façade by means of a plumb-rule or a laser
3. Fit the adjustable brackets
4. Fit the supporting laths on the brackets
5. Align the supporting laths horizontally and vertically in a section by the gradual arrangement of the brackets (maximum unevenness is less than $L/1000$)
6. Fit the EURO PANELS OVERSEAS N.V. cut-to-size façade strips. One starts at the bottom of with a starting strip and fits the strips using a metal lath with straight edge.

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6 Fixing method



6.1 Maximum distance between the fixing accessories

The horizontal centre to centre distance between the fixing accessories is determined by:

- the width of the panel
- the maximum distance centre to centre distance between the vertical supporting structure (see § 3 page 1)
- the maximum distance between the fastening accessories in relation to the actual wind load
- the distances from the edge of the fastening accessories (see § 6.2)
- the joint opening

As a general rule the following maximum distances between the fixing accessories must be respected.

Actual wind load	Maximum center-to-center distance for the fixing accessories
N/m ²	mm
≤ 800	600
≤ 1200	500
≤ 1500	400
> 1500	300

For single spans the following maximum distances between the fixing accessories must be respected.

	Maximum center-to-center distance for the fixing accessories	
	mm	
	Land 0-20 m	Land 20-50 m Coast 0-20 m
Single span	500	400

Example:

width of panel = 1220 mm, maximum distance between screws = 600 mm, distance from edge screws = 25 mm, joint opening = 10 mm

→→→ centre to centre distance between supporting laths = $(1220+10)/2 = 615$ mm

→→→ distance between the screws = $(1220-2*25)/2 = 585$ mm ≤ 600 mm

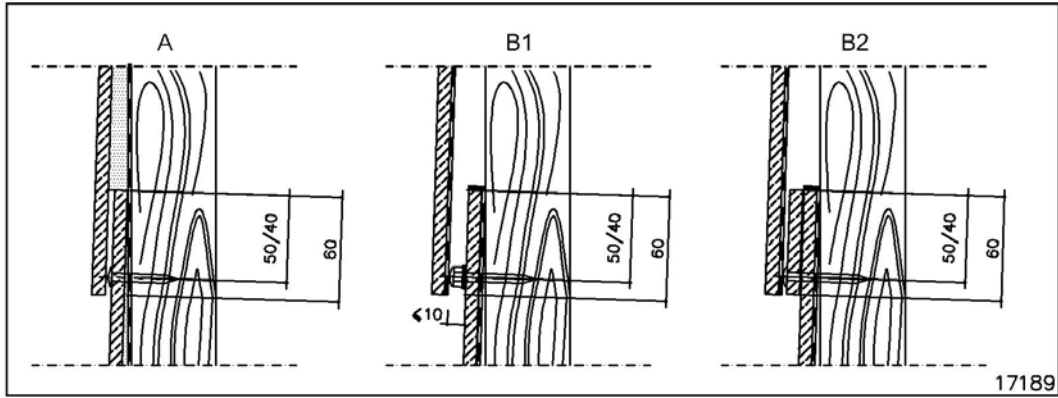
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6.2 Fixing variants and distances

INVISIBLE FIXING

A: closed fixing (EPDM joint strip)

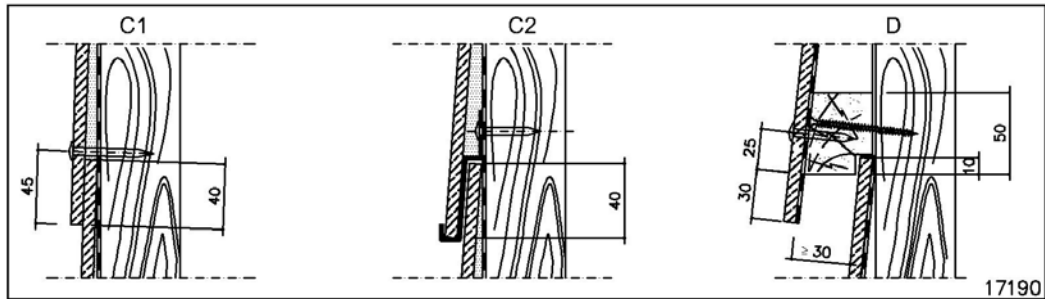
B: open fixing (aluminium joint strip)



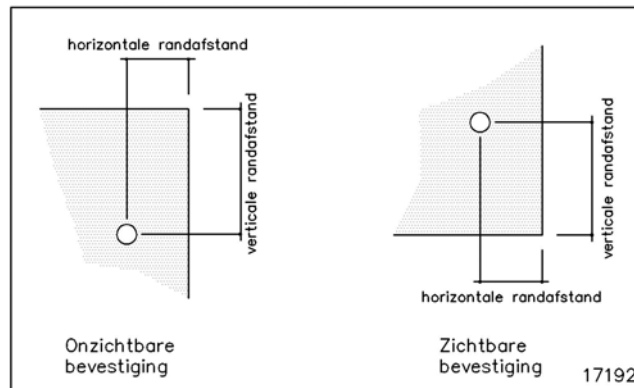
VISIBLE FIXING

C: closed fixing (EPDM joint strip)

D: open fixing (aluminium joint strip)



DISTANCES FROM THE EDGE



Cut-to-size façade strips: in overlap on wooden supporting structure

The following table provides the measures and maximum distances. Drilling the holes can be done using a template.

fixing variant	strip height to	visible strip height to	vertical overlap	vertical distance from edge	horizontal distance from edge	maximum distance between screws centre area		maximum horizontal distance between screws edge zone		
						Land: 0-20m	Land: 20-50m Coast: 0-20m	Land: 0-10m	Land: 10-20m	Land: 20-50m Coast: 0-20m
	Mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
A	240	180	60	40	25	600	500	500	400	(2)
A	300	240	60	50	25	600	400	400	300	(2)
B (4)	240	180	60	40	25	600	500	500	400	(2)
B (4)	300	240	60	50	25	600	400	400	300	(2)
C	300	260	40	45 (1)	25 (1)	600	600	600	600	500
C	400	360	40	45 (1)	25 (1)	600	600	600	500	400
C	600	560	40	45 (1)	25 (1)	600	500	500	400	300
D (3) (4)	300	260	40	55	25	600	600	600	600	500
D (3) (4)	400	360	40	55	25	600	600	600	500	400
D (3) (4)	600	560	40	55	25	600	500	500	400	300

- (1): for fixing variant C2 no screws are fixed in the panel
- (2): changing to visible fixing
- (3): for fixing variant D the façade panel is supported by the continuous wooden profile
- (4): open fixing is not allowed for autoclaved products like ETER-COLOR and OPERAL PRECUT STRIPS

Cut-to-size façade strips: in overlap on wooden supporting structure

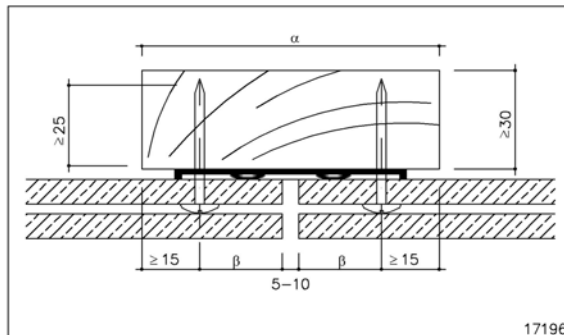
6.3 Fixing with screws

The cladding panel is fixed by means of a stainless steel (quality A2, AISI 304) panel screw with TORX T20 recessed head to the wooden supporting laths.

- For visible fixing coloured screws can be used
- For invisible fixing non coloured screws can be used

The following dimensions must be respected.

- minimum screw depth in supporting lath : 25 mm
- minimum remainder past screw in supporting lath : 10 mm
- minimum distance from edge screw in supporting lath : 15 mm



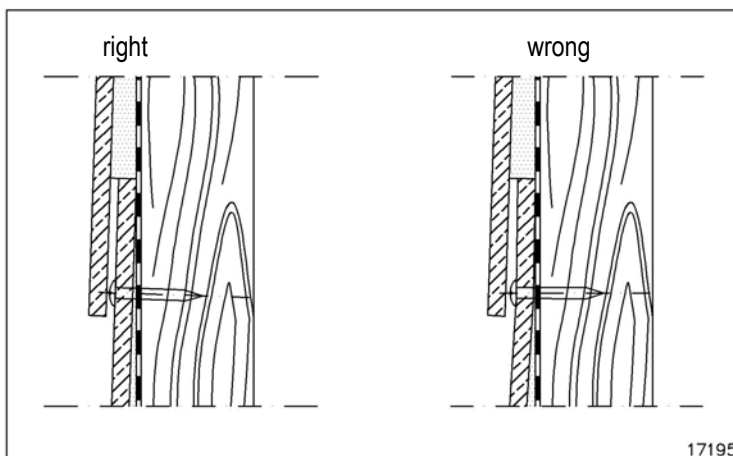
α	≥ 90
β	25

The screw length required is dependent on

- the fixing variant
- the thickness of the façade panel
- the minimum screw depth in the wooden lath

For fixing variant D the horizontal wooden profile must be pre-drilled to avoid the formation of cracks.

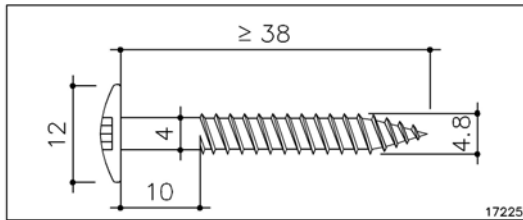
The screws are inserted using an electric drill with a high quality bit suitable for the type of screw head. The screws must be inserted perpendicular to the panel surface, and may not be tightened to too firmly so that the free expansion of the panel is impeded. This is achieved by limiting the moment setting of the drill.



Cut-to-size façade strips: in overlap on wooden supporting structure

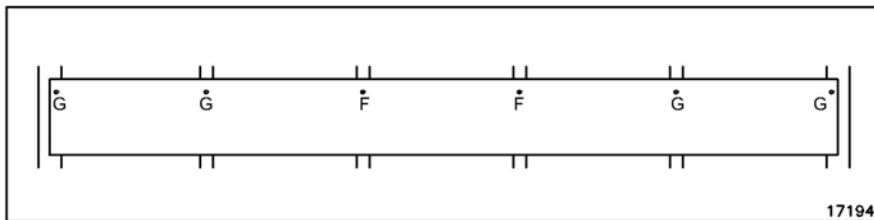
a. ETER-COLOR

The following design of the screw must be respected.

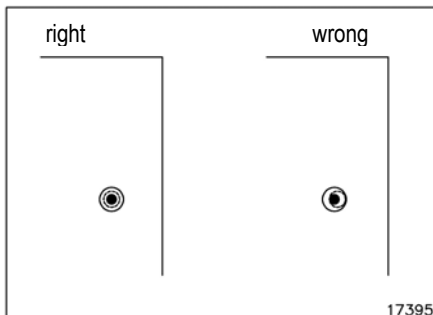


Holes for fixing points are pre-drilled in the panel. For each panel, two fixed fastening points (F) located side by side are provided. All other pre-drilled holes are free fixing points to allow movements of the panel (G).

- diameter of fixed fastening point : 5 mm
- diameter of free fastening point : 8 mm

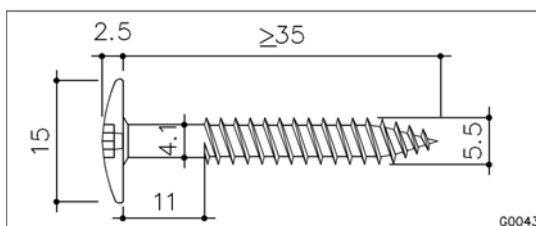


The screws must be applied in the centre of the pre-drilled holes.



b. TEXTURA, NATURA

The following design of the screw must be respected.



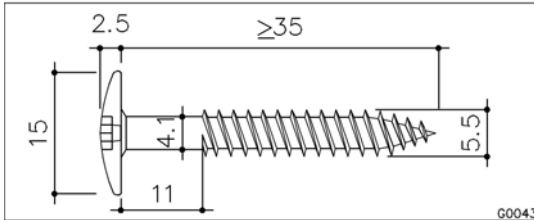
Holes for fixing points are pre-drilled in the panel. Only pre-drilling with special fibre cement drills in hard metal.

- diameter of fastening point : 6 mm

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c. PICTURA, NATURA PRO

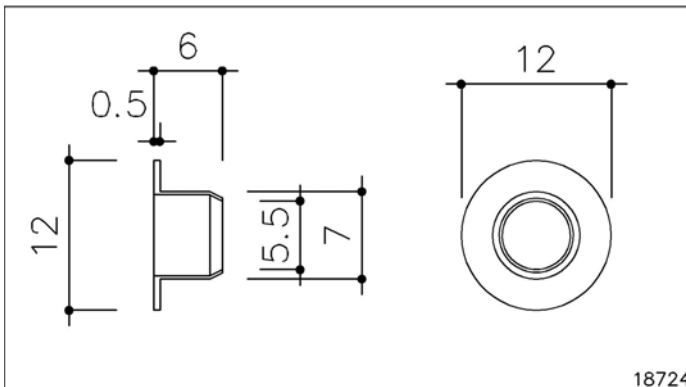
The following fixing instructions must be respected.



Holes for fixing points are pre-drilled in the sheet. Only pre-drilling with special fibre cement drills in hard metal.

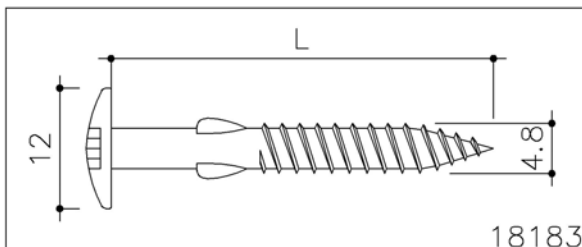
- diameter fixing point : 7 mm

A special sleeve is placed in the drill holes to protect the surface of the PICTURA panel.



d. OPERAL

The following design of the screw must be respected. The screw is provided with a very sharp point and wings on the shaft so the pre-drilling of the panel is not needed.



Cut-to-size façade strips: in overlap on wooden supporting structure

6.4 Fixing with clips for overlap (visible fixing)

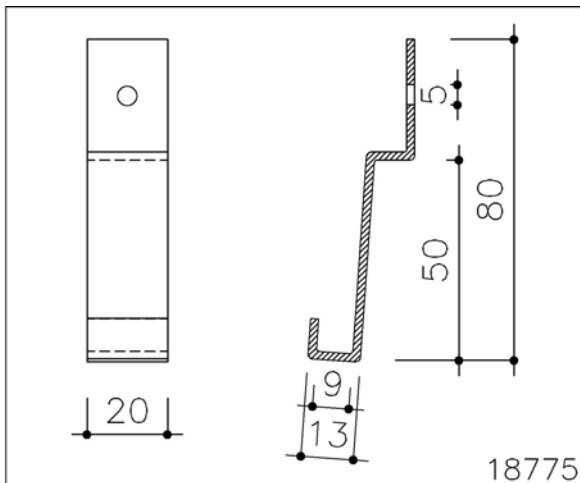
The cladding panel is fixed by means of a stainless steel (quality A2, AISI 304) clip to the wooden supporting laths. The clips are fixed with a stainless steel panel screw with TORX T20 recessed mushroom head.

The following dimensions must be respected.

- minimum screw depth in supporting lath : 25 mm
- minimum remainder past screw in supporting lath : 10 mm
- minimum distance from edge screw in supporting lath : 15 mm

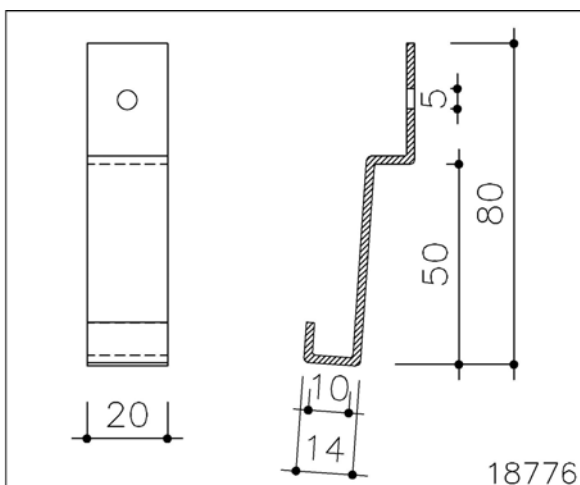
a. ETER-COLOR, TEXTURA, NATURA, PICTURA, NATURA PRO

The following design of the clip must be respected.



b. OPERAL

The following design of the clip must be respected.



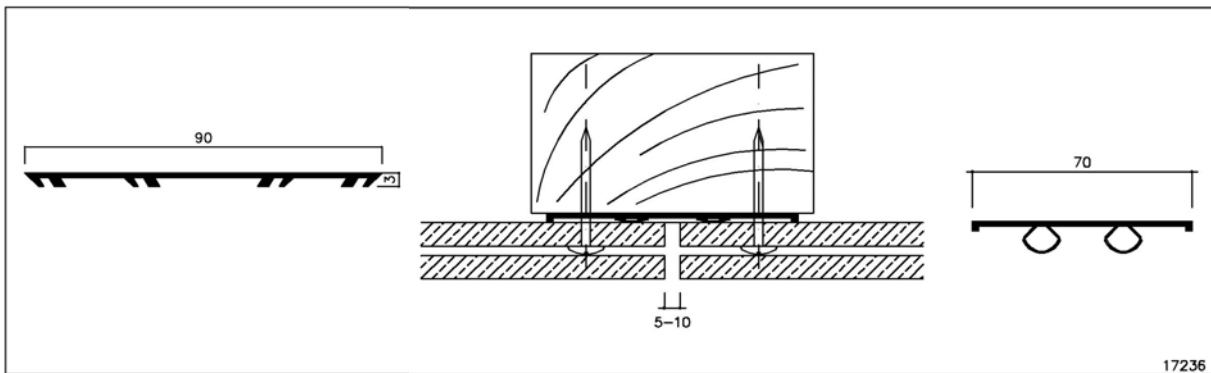
Cut-to-size façade strips: in overlap on wooden supporting structure

7 Joints

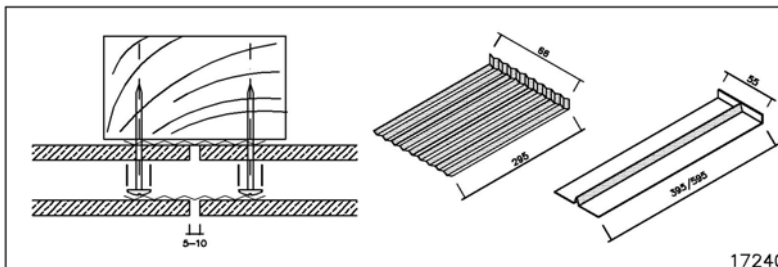
The fibre-cement strips must be placed with an open joint to allow the free movement of the strips. A UV-resistant joint sealing strip must be placed behind the joints between the fibre-cement strips to avoid water penetration and to protect the wooden laths.

- joint width : 5 – 10 mm

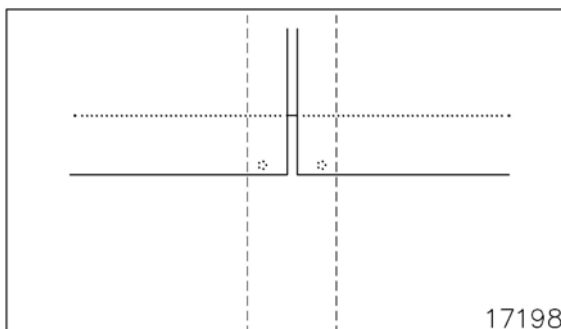
For closed fixing variants an EPDM joint sealing strip with ridges is used. The screw must be fixed between the ribs of the joint profile in such a way that penetrated rainwater can run off between the ribs. An EPDM joint sealing strip with two flexible sealing tubes, where the raised flexible sealing tube of the joint sealing strip seals the open space behind the fibre-cement strips at the joint, is also possible. A similar joint sealing strip is placed on laths without joint finishing to obtain good evenness. As an alternative the laths can be fixed in such a way to compensate the difference in thickness due to the joint sealing strip.



For open fixing variants a black corrugated or ribbed aluminium profile is used that is bent over at one end and hung to the rear end of each fibre-cement strip and also applied in overlap.



For invisible fixing in semi or free pattern, two fixing points are provided on the fibre-cement strip under the open joint as support.



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The table below gives an overview of the accessories per fixing variant.

Variant	z/o	o/g	Joint sealing strip	Screw length	other
A	invisible	closed	EPDM	38	
B1	invisible	open	aluminium	44	ring & washer
B2	invisible	open	aluminium	44	
C1	visible	closed	EPDM	44	
C2	visible	closed	EPDM	38	suspension clip
D	visible	open	aluminium	38	wooden profile

8 Accessories²

The following accessories can be obtained from EURO PANELS OVERSEAS N.V..

Perforated sealing profile	Blank aluminium	50 x 30 x 2500 mm
Perforated sealing profile	Blank aluminium	70 x 30 x 2500 mm
Perforated sealing profile	Blank aluminium	100 x 30 x 2500 mm
Open outer corner profile	Black coated aluminium	17 x 17 x 2500 mm
Connection profile window	Black coated aluminium	8 x 15 x 45 x 3000 mm
Binnenhoek profiel	Black coated aluminium	35 x 25 x 3000 mm
Eindprofiel	Black coated aluminium	8 x 27 x 45 x 3000 mm
Single sided adhesive foam strip	PVC	6 x 9 mm x 15 m
Joint profile with ridges for vertical joint	EPDM	90 x 1 mm
Joint profile with ridges for intermediate support	EPDM	45 x 1 mm
Flat joint profile	EPDM	100 x 0,75 mm
Screw for Eter-Color	Coated stainless steel	4,8 x 38 K 12 mm
Screw for Operal	Coated stainless steel	4,8 x 38 K 12 mm
Screw for Textura	Coated stainless steel	5,5 x 35 K15 mm
Screw for Natura	Coated stainless steel	5,5 x 35 K15 mm
Screw for Pictura	Coated stainless steel	5,5 x 35 K15 mm
Screw for Natura Pro	Coated stainless steel	5,5 x 35 K15 mm
Sleeve for Pictura/Natura Pro	Stainless steel	Ø 7 – 12 mm
Fixing clip 8 mm	Stainless steel	Opening 8 mm
Fixing clip 9 mm	Stainless steel	Opening 9 mm
Screw for fixing clip	Stainless steel	4,8 x 38 K 12 mm

9 Other construction details

Movements in the metal sections (corner section, bottom section, etc.) must always be detached from the panels. If necessary the aluminium sections must be pre-drilled, and are fixed according to the principle of fixed and free fastening points. Joints between the metal sections must coincide with joints between the panels.

Finishing sections in metals that can leach (such as zinc, copper, lead, etc.) are advised against because of possible soiling.

The following construction details can be found on the EURO PANELS OVERSEAS N.V. website.

OUTER CORNER: Corner finishing can be provided by means of a joint sealing strip or a finishing profile of aluminium or PVC.

INNER CORNER: A joint sealing strip or finishing profile in aluminium or PVC can also be used here.

BOTTOM FINISHING: The open cavity between the back of the panel and the insulation or the back construction must be sealed at the bottom by a perforated aluminium sealing profile. This profile prevents the entry of birds and vermin. The raised leg of the sealing profile is clamped between the wooden supporting lath and the panel. A starting strip is provided for the bottom strip in such a way that it is at the same angle as the other strips. The thickness of the starting strip for the bottom strip is determined by the fixing variant.

² Use Euro Panels Overseas N.V. accessories; not using standard Euro Panels Overseas N.V. accessories may lead to cancellation of the Euro Panels Overseas N.V. guarantee.

Cut-to-size façade strips: in overlap on wooden supporting structure

TOP FINISHING: Sufficient ventilation openings must be provided.

WINDOW FINISHING WITH RETURN: Sufficient ventilation openings must be provided at the top and bottom of the window.

WINDOW FINISHING WITHOUT RETURN: Sufficient ventilation openings must be provided at the top and bottom of the window.

EXPANSION JOINT: The expansion joints in the building must also be included in the cladding. They are obtained by placing an aluminium profile on both sides of the joint.

10 Health and safety aspects

During the mechanical machining of panels, dust can be released which can irritate the airways and eyes. Apart from this, the inhalation of fine (respirable size) quartz containing dust, particularly when in high concentrations or over prolonged periods of time can lead to lung disease and an increased risk of lung cancer. Depending on the working conditions, adequate machinery with dust extraction and/or ventilation should be foreseen. For more ample information, please check the Safety Data Sheet according to 91/155/EEC.

11 More information

Information about the various cladding panels can be found in the EURO PANELS OVERSEAS N.V. product information sheets. They can be found on the website or can be obtained on demand by phone. Information about external suppliers can also be downloaded from the website.

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