



KOMO[®]

Product Certificate



Number	K4345/06	Replaces	K4345/05
Issued	2013-08-01	dated	2010-04-01
Valid until	Indefinitely	Page	1 of 17

Massief NT external wall cladding

Plastica Plaat B.V.

DECLARATION BY KIWA

This product certificate is based on BRL 4101 part 1 " External wall cladding with panels: general requirements dated 15 October 2012 in combination with BRL 4101 part 4 "External wall cladding with panels: supplementary requirements for decorative panels based on thermosetting resin" dated 18 December 2012, issued in accordance with the Kiwa Regulations for Product Certification.

Kiwa declares that:

- legitimate confidence exists that the Massief NT supplied by the certificate holder complies at delivery with the technical specifications laid down in this Product Certificate, provided that the Massief NT has been marked with the KOMO[®] mark in the manner indicated in the Product Certificate;
- the building components composed of these certified products deliver the performance described in this product certificate, on the condition that:
 - the manufacture of the building components corresponds with the processing methods determined in this product certificate;
 - the application conditions described in this product certificate are complied with.

Kiwa declares that, taking the above into consideration, Massief NT complies in its application with the requirements of the Building Decree, as specified on page 3 of this quality declaration.

Kiwa declares that it has not checked the production of the other parts of the building components nor the manufacture of the building components for this product certificate.

This certificate is a recognised quality declaration in accordance with the Tripartite agreement (Dutch Bulletin of Acts 132, 2006) and the Housing Act. The certificate is included in the "Overview of recognized quality declarations in construction" on the SBK website: www.bouwkwaliteit.nl.

Bouke Meekma
Kiwa

The certificate is included in the overview on the Stichting KOMO website: www.komo.nl.

Advice: consult www.kiwa.nl to ascertain whether this certificate is valid.

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Building Decree

The following have been assessed:

- quality system
- product
- product performance when use
- Periodic inspection

Massief NT external wall cladding

LIST OF CONTENTS

1.	BUILDING DECREE ENTRY	4
2.	TECHNICAL SPECIFICATIONS	4
2.1	SUBJECT.....	4
2.2	GENERAL.....	4
2.2.1	Shape and composition.....	4
2.2.2	Dimensions and size tolerances	4
2.2.3	Colour and surface structure	5
2.2.4	Physical and mechanical properties	5
2.3	MARKS.....	6
3.	SYSTEM SPECIFICATION	6
3.1	SUPPORT STRUCTURE.....	6
3.1.1	Composition	6
3.1.2	Design.....	6
3.1.3	Detailing.....	6
3.2	FASTENING METHODS.....	6
3.2.1	Continuous visible fastening system.....	6
3.2.2	Blind fastening.....	7
3.3	FASTENING MATERIALS.....	7
3.3.1	General	7
3.3.2	Anchoring materials for the support structure	7
3.3.3	Fastening materials for Massief NT	7
3.4	THERMAL INSULATION.....	7
3.5	ACCESSORIES	7
4.	PROCESSING REGULATIONS.....	8
4.1	TRANSPORT	8
4.2	STORAGE	8
4.3	PROCESSING	8
4.4	DESIGN REGULATIONS	8
4.5	ASSEMBLY.....	8
4.6	INSTRUCTIONS FOR JOINTS	9
4.7	INSTRUCTIONS FOR VENTILATION.....	10
4.8	INSTRUCTIONS FOR THE APPLICATION OF THERMAL INSULATION.....	10
4.9	INSTRUCTIONS FOR DETAILING	10
5.	PERFORMANCE	10
5.1	TECHNICAL BUILDING REGULATIONS FROM A SAFETY POINT OF VIEW	10
5.1.1	General strength of the structure, Building Decree section 2.1	10
5.1.2	Limiting the occurrence of a fire risk situation, Building Decree section 2.8	10
5.1.3	Limitation of the development of fire and smoke, Building Decree section 2.9	10
5.1.4	Limiting the spread of fire, Building Decree section 2.10.....	11
5.2	TECHNICAL BUILDING REGULATIONS FROM A HEALTH POINT OF VIEW	11
5.2.1	Protection from outside noise - new build, Building Decree section 3.1.....	11
5.2.2	Resistance to damp, Building Decree section 3.5.....	11
5.2.3	Limitation of the presence of hazardous substances and ionising radiation, Building Decree section 3.9.....	11

Massief NT external wall cladding

5.2.4	Protection against vermin, Building Decree section 3.10	11
5.3	TECHNICAL BUILDING REGULATIONS FROM AN ENERGY SAVING POINT OF VIEW	11
5.3.1	Energy efficiency - new build, Building Decree section 5.1	11
5.4	OTHER PERFORMANCES.....	11
5.4.1	Movement and distortion, BRL 4101 part 1 article 5.4	11
5.4.2	Resistance to impacts from outside, BRL 4101 part 1 article 5.5	12
5.4.3	Durability, BRL 4101 part 4 articles 5.3.2 and 5.3.3.....	12
6.	RECOMMENDATIONS FOR THE USER	12
7.	BUILDING PRODUCT REGULATIONS	12
8.	LIST OF DOCUMENTS MENTIONED*.....	12
9.	PRINCIPLE DETAILS	14
9.1	FASTENING WITH SCREWS	14
9.2	BLIND FASTENING	15
9.3	WEATHERBOARDING	16
9.4	MODULO	17

Massief NT external wall cladding

1. BUILDING DECREE ENTRY

No.	article; parts	section	limit value/ determination method	performance in accordance with quality declaration	comments in regard to use
2.1	2.2 2.3 2.4; 1a, b, d and 2	General strength of the structure	Not yield in accordance with: NEN-EN 1990, NEN-EN 1991 (natural weight), NEN-EN 1991-1-4 (wind) NEN-EN 1995-1-5 (temperature differences)	Suitability for use (situation and height of building) Pullout resistance > 2000 N	Joints and fastenings according to Chapter 3
2.8	2.57	Limitation of the occurrence of a fire risk situation	Fire class A1 in accordance with NEN-EN 13501-1	Not specified	
2.9	2.67 2.68; 1 to 3	Limitation of the development of fire and smoke	Contribution to fire spread \geq class D and smoke class s2 in accordance with EN-EN 13501-1	Euro class B-s2, d0	
2.10	2.84	Limitation of fire spread	WBDBO (Resistance to Fire Penetration and Flash-over) \geq 30 minutes, in accordance with NEN 6068	No fire-retarding properties may be attributed to panels	The fire resistance of the entire external wall structure must be evaluated. The information included in articles 5.1.2.to 5.1.4 can be used to determine the fire penetration and flash-over
3.1	3.2 3.3	Protection against external noise, new build	Characteristic sound-proofing between outside and occupied area 20 dB(A) and between outside and occupied room \geq 18 dB(A)	No sound-proofing properties may be attributed to panels	The sound-proofing of the entire external wall structure must be evaluated. The information included in articles 5.1.2.to 5.2.1 can be used to determine the sound-proofing capacity
3.5	3.21; 1 to 3 3.22	Damp proofing	Waterproof in accordance with NEN 2778 Temperature factor > 0.5 or 0.65 in accordance with NEN 2778	Panels are waterproof, the joints are water-resistant Temperature factor \geq 0.5 or 0.65	Depends on designated use
3.9	3.63	Limitation of the presence of hazardous substances and ionising radiation	In accordance with ministerial regulation	Complies with regulations	
3.10	3.69	Protection from vermin	Penetration by rats and mice is prevented	No openings > 0.01 m	Carry out assembly and detailing according to chapters 3 and 4
5.1	5.3 5.4 5.5	Energy efficiency, new build	Heat resistance of the partitioning structure \geq 3.5 m ² K/W according to NEN 1068 Air volume flow in all areas and rooms < 0.2 m ³ /sec, in accordance with NEN 2686	$\lambda = 0.3$ W/m·K Panels are airtight	Carry out assembly and detailing according to chapters 3, 4 and 9

NEN - Netherlands Standardization Institute

EN- European Norm

2. TECHNICAL SPECIFICATIONS

2.1 SUBJECT

External cladding systems in accordance with evaluation guideline 4101 part 4 "Cladding with panels. Additional requirements for decorative panels based on thermosetting resin".

2.2 GENERAL

2.2.1 Shape and composition

Massief NT is a material composed from thermosetting resins and wood fibre that has been compressed under high pressure and at a high temperature into a homogeneous external cladding panel. The panel has a core of impregnated cellulose strips and a sealed acrylate top layer for maximum durability.

2.2.2 Dimensions and size tolerances

The nominal dimensions and the accompanying tolerances are discerned in table 1. Different formats and thicknesses or lengths and/or widths cut to measure are available on request. The maximum permissible size deviations for made-to-measure panels can be agreed between the parties should they arise.

Massief NT external wall cladding

Table 1 Nominal panel dimensions in mm

Dimensions	Length ¹⁾	Width ¹⁾	Thickness		
	[mm]	[mm]	[mm]		
Dimensions	2140	1060	6.0	8.0	10.0
	2800	1300	6.0	8.0	10.0
	2800	1850	6.0	8.0	10.0
	4100	1300	6.0	8.0	10.0
	4100	1850	6.0	8.0	10.0
Tolerance	+ 10.0	+ 10.0	+ 0.4	+ 0.5	+ 0.5
	- 0.0	- 0.0	- 0.4	- 0.5	- 0.5

Other tolerances for production panels¹⁾

- Squareness : < 1.5 mm per metre;
- Linearity : ± 1.0 mm per metre;
- Flatness : ± 2.0 mm per metre;

¹⁾ Other agreements can be made between the parties in respect to these tolerances.

2.2.3 Colour and surface structure

Surface : Slightly structured
 Colours : Massief NT is standardly available in several colours.
 A colour chart is available from Plastica Plaat B.V.

2.2.4 Physical and mechanical properties

Table 2 Material properties

Property	Requirement BRL 4101	Performance Massief NT	Unit	Standard
Fire class	D-s2	B-s2, d0	class	NEN-EN 13501-1
Density	≥ 1350	≥ 1400	kg/m ³	EN-ISO 1183-1
Bending strength: - in longitudinal direction - in crosswise direction	≥ 80 ≥ 80	≥ 90 ≥ 90	N/mm ² N/mm ²	EN-ISO 178
E-modulus: - in longitudinal direction - in crosswise direction	≥ 9000 ≥ 9000	≥ 9500 ≥ 9500	N/mm ² N/mm ²	EN-ISO 178
Tensile strength: - in longitudinal direction - in crosswise direction	≥ 60 ≥ 60	≥ 80 ≥ 80	N/mm ² N/mm ²	EN-ISO 527-2
Resistance to thermal shock: - changes in bending strength, D _s - changes in E-modules, D _m - changes in appearance	> 0.95 > 0.95 ≥ 4	> 0.95 > 0.95 ≥ 4	% % class	EN 438-2, 19 EN 438-2, 19 & 29
Durability, damp resistance: - increase in mass - changes in appearance	≤ 8 ≥ 4	≤ 4 ≥ 5	% class	NEN-EN 438-2, 15
Impact resistance: - height of drop 1800 mm, diameter of imprint	≤ 10	≤ 8	mm	NEN-EN 438-2, 21
Dimensional stability at raised temperatures: - change in length - change in thickness	≤ 0.30 ≤ 0.60	≤ 0.20 ≤ 0.50	% %	NEN-EN 438-2, 17
SO ₂ resistance	≥ 3	4-5	class	DIN 50018 / NEN-ISO 105-A02
UV-resistance: - blister formation - crack formation - colour fastness - difference in lustre	none ≥ 4 ≥ 3 ≤ 50	none ≥ 5 4-5 ≤ 50	class class class %	BRL 4101-4, 5.3.3 BRL 4101-4, 5.3.3 NEN-ISO 105-A02 DIN 67530
Resistance to submersion in boiling water: - average increase in mass - average increase in thickness - changes in appearance	< 3,0 < 6,0 ≥ 4	< 1,15 < 1.5 ≥ 5	% % class	EN 438-2, 12
Heat conductivity coefficient (λ)	none	± 0.3	W/(m·K)	EN 438-7
Heat expansion coefficient ¹⁾	none	18 x 10 ⁻⁶	1/k	DIN 52328

¹⁾ The actual joint thickness required is calculated with a linear expansion of 2.5 mm/m¹. A jump in temperature of between -15 to +90 °C with a difference in relative humidity of 85% is assumed here.

Massief NT external wall cladding

2.3 MARKS

The products are marked with the KOMO[®] logo.

The execution of this mark is as follows:

- see front of quality declaration.



Location of mark:

- a label is applied to each packaging unit.

Compulsory details on the label:

- KOMO[®] mark;
- number of the quality declaration;
- factory mark;
- production code which guarantees the traceability (date, machine and/or shift number);
- nominal panel dimensions (length, width, thickness);
- colour coding of the décor;
- details of fire properties.

3. SYSTEM SPECIFICATION

3.1 SUPPORT STRUCTURE

3.1.1 Composition

Wood

A base structure of wood must consist of a vertical framework; wooden battens that are strong and wide enough and have lasting durability. The wooden structure must be detailed in such a way that the utmost limit values or usability limits are not exceeded as a result of changes to the geometry during the reference period.

Comment

The possibility of a 20 mm-deep ventilated column and the thickness of any insulation layers present must be taken into consideration when the dimensions of the wooden cross-section(s) are determined.

Aluminium

- A base structure of aluminium consisting of wall supports upon which vertical bearing profiles are mounted. Visible fastening by blind rivets is possible on it.
- A base structure of aluminium with horizontal bearing profiles. The panel material is fastened blind using adjustable wall hooks which are attached to the panel by inserts.

3.1.2 Design

Static calculations relating to the dimensioning of the bearing structure must be made in accordance with NEN-EN 1990. The design values for the relevant loads in respect to the utmost limit values for the fundamental load combinations must be derived from NEN-EN 1991-1-1+NB (natural weight), NEN-EN 1991-1-4+NB (wind load).

Application conditions

1. *The distance between the fasteners and the edges of the panel is minimum 20 mm and maximum 100 mm (depending on the panel thickness).*
2. *The wooden structures may not be exposed to temperatures higher than 60 °C.*
3. *Condition for temperature differences: The panels must be able to freely expand in length and width; in this respect there must be free joint width of at least 2.5 mm/m¹ and a minimum of 8 mm along the panel edges*
4. *Condition for impact load on adjoining floor: NEN-EN 1991-1-1+NB.A.*
5. *Condition for impact load height difference: NEN-EN 1991-1-1+NB.A.*

3.1.3 Detailing

The detailing must be executed in accordance with the current state of technology. Several principle details are shown in chapter 9 of this product certificate.

Instructions for the support structure

Appropriate structural measures must be taken to prevent wood rot if the edge moisture content of the wood used is higher than 20% (determined in accordance with NEN 5461). Damage to the wood must be avoided by using wood preserving agents based on salts.

Comment

Machine processing of preserved wood could lead to a reduction in the durability.

Instructions for the joint seals

The type of seal chosen depends on the way Massief NT is processed (see also the details in chapter 9).

3.2 FASTENING METHODS

3.2.1 Continuous visible fastening system

The following fastening techniques have been recognised:

- fixed distance supports, where the panel is attached to a wooden or aluminium framework;
- adjustable distance supports, where the panel is attached to a wooden or aluminium support structure by adjustable aluminium distance supports;

Massief NT external wall cladding

The fastening is as follows:

- in the case of wooden supports, with Plastica Torx screws with coloured head 4.8 x 38 en 4.8 x 25 mm (figure 1);
- in the case of aluminium supports, with M5 x 20 mm / 55 mm bolts or blind rivets (figure 2).

3.2.2 Blind fastening

Suspension system

Panels thicker than 8 mm are suitable for blind fastening; stainless steel or brass inserts are applied on the back of the panels. Various fastening and suspension systems are available, comprising fasteners, suspension hooks, adjustable distance supports and wall hooks.

Bonding

Panels thicker than 6 mm can be blind fastened using adhesives. The Plastiflex[®]-NT adhesive system can be used for Massief NT. Reference: KOMO[®] product certificate "Adhesive for fastening external cladding".

Weatherboarding

6 mm thick panels can be fastened using assembly clamps (figure 3). Panels are prepared with a groove on the underside and are assembled overlapping from the bottom up.

Modulo ME05

Prepared 8 mm Massief NT panels (1000 x 400 and 500 x 400 mm) can be invisibly fastened mechanically using special profiles.

3.3 FASTENING MATERIALS

3.3.1 General

Adequate information about the material properties of the fasteners used must be available; in particularly the permissible tensions, the accompanying distortion, the behaviour over time and the behaviour under certain physical and chemical conditions. The fasteners must be resistant to corrosion in all cases (stainless steel for example).

3.3.2 Anchoring materials for the support structure

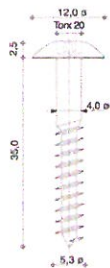
Wedge bolts, screws and plugs, suitable for use in stony materials.

3.3.3 Fastening materials for Massief NT

Massief NT must be fastened using the following materials:

- Plastica torx screw with coloured head in the colour of the Massief NT panels
- Blind rivet with coloured head in the colour of the Massief NT panels
- The Plastiflex[®] NT adhesive fastening system, if necessary in combination with Plastiflex[®] Primer-S to prepare wood and other porous surfaces such as concrete, gas concrete and wood chipboard. Consult the Plastiflex[®] NT processing procedure.
- Weatherboard clamp.
- Modulo ME05 fastening profile.

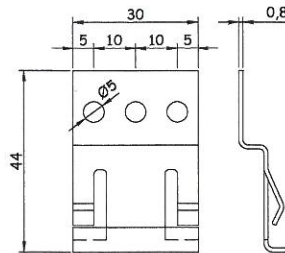
Fastening materials



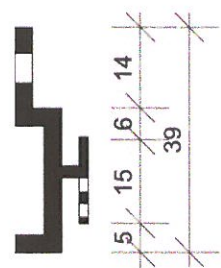
1. Plastica Torx screw



2. Blind rivet



3. Weatherboard clamp



4. ME05 profile

3.4 THERMAL INSULATION

The design value for the heat conductivity coefficient (λ) is 0.3 W/(m·K) for Massief NT. An insulation layer must be applied behind the panels if demands are made on the heat resistance (R_c) of the entire external partitioning structure.

Application conditions

1. The heat resistance (R_c) of the entire external partitioning structure must be determined in accordance with NEN 1068.
2. The design values for the heat conductivity coefficients of the building materials used must be determined in accordance with EN 12667 when they are not already adequately known.

Comment

Reference is made to the existence of KOMO[®] product certificates which describe the specifications of the insulation materials.

3.5 ACCESSORIES

Aluminium, PVC or EPDM rubber profiles for sealing the joints between the Massief NT panels.

Massief NT external wall cladding

4. PROCESSING REGULATIONS

4.1 TRANSPORT

Consideration must be given to the use of stable, flat pallets which are at least the same size as the panels when transporting Massief NT.

Panels must be prevented from sliding around on top of each other to avoid damage from chafing particles; the panels must be picked up one at a time when loading and unloading.

4.2 STORAGE

Massief NT must be stored in enclosed spaces, at normal ambient temperatures and air humidity and protected from damp and heat. When stored horizontally on pallets, support must be given across the entire panel and a protective layer is required between the bottom panel and the pallet and over the top panel of each pallet.

When stored vertically, the panels must stand completely square at the sides and the full height must be supported in such a way that the same weather conditions prevail on both sides of the panel.

4.3 PROCESSING

Massief NT must always be re-sawn before use. The panels can be processed using wood processing tools with hard metal (Widia) cutting edges. A protective or sealing treatment is not required on the new surfaces after processing (sawing, drilling, milling, bevelling, sanding or possible polishing).

Recommendations during machine processing

- The visible side of the panel must be uppermost during sawing; however the décor side must be underneath when using a jigsaw that moves upwards.
- The use stationary tools with moving tables is preferable.
- A type T118B saw table should be used;
- Use interleave paper or underlay and make sure that there are no splinters from sawing when re-using.
- The inner angles of rebates for instance should be rounded off to prevent notching.

It is recommended that the angles are pre-drilled using a Ø 6 mm or larger drill.

4.4 DESIGN REGULATIONS

Static calculations in respect to the dimensioning and fastening of the panel and support structure must be executed in conformity with NEN-EN 1991, based on the design value of:

- The natural weight of the cladding;
- The wind load;
- The loads resulting from temperature differences;
- Impact loads.

The method of determination and the relevant standards are shown in BRL 4101 part 1.

When determining the deflection, the wind load can be multiplied by 0.7.

The deflection of the panels should be less than or equal to 1/200 x the span and/or fastening interval.

The edge distances and the quantity of fasteners can be found in paragraph 4.5.

4.5 ASSEMBLY

Support structure

It is essential that the support structure is properly aligned so that the cladding is smooth. The support structure must be detailed in such a way that the utmost limit values or usability limits are not exceeded as a result of changes to the geometry during the reference period. The detailing must be done in conformity with the current state of technology. Several principle details are shown in chapter 9 of this KOMO[®] product certificate.

The creation of continuous ventilation at least 20mm wide behind the panels is essential. Ventilation openings must be made both at the top and bottom (see paragraph 4.7) when continuous ventilation is required on horizontal framework. The height of the external wall determines the size of the ventilation opening.

The sealing profiles must fit perfectly and be applied at the correct places.

The Plastica Plaat B.V. processing regulations must be complied with at all times when Massief NT is assembled.

The diameters for the fastening holes for Massief NT are shown in table 3.

Table 3 Diameter of screw holes

Type of screw	Hole diameter	
	Dilation point	Fixation point
Plastica Torx screw with coloured head 7 mm	8.0 mm	6.0 mm

The fastening materials must not be tightened too much as the panels will become distorted, see below.

Table 4 Fastening interval

Fastening intervals, horizontally and vertically for:	Panel thickness:		
	6 mm	8 mm	10 mm
2 support points (in mm)	470	620	770
3 or more support points (in mm)	600	770	920
Fastening intervals min. 20 mm and max.	60	80	100

Massief NT external wall cladding

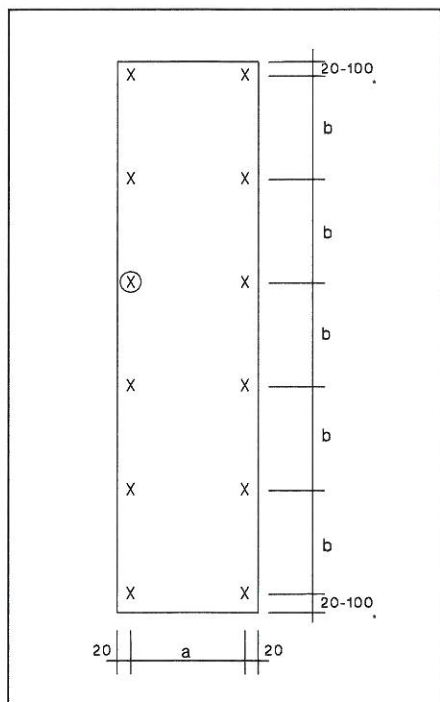


Figure 5: 2 support points per panel

- ⊗ fixation point
- x dilation point

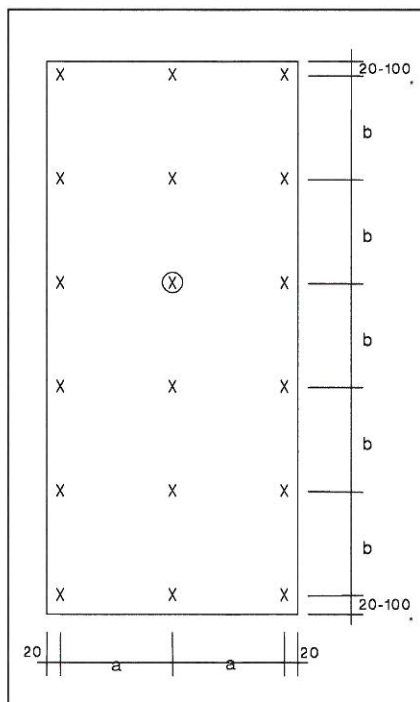


Figure 6: 3 support points per panel

- a = horizontal
- b = vertical

Comments

1. Screw anchoring must be calculated for buildings higher than 20 m¹.
2. Screw intervals depend on the flatness requirements as well as on strength.
3. Figure 7 is referred to for determining positions in windy areas and the type of environment.

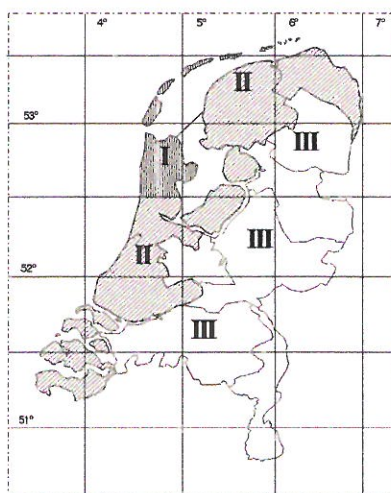


Figure 7: Division of the Netherlands into wind areas in accordance with NEN-EN 1991-1-4+NB.

Area I:

Markermeer, the Wadden Islands and the part of Noord-Holland north of the municipalities of Heemskerk, Uitgeest, Wormerland, Purmerend and Edam-Volendam.

Area II:

Groningen, Friesland, Flevoland, the other Noord-Holland municipalities, Zuid-Holland and Zeeland.

Area III:

Drenthe, Overijssel, Gelderland, Utrecht, Noord-Brabant and Limburg

4.6 INSTRUCTIONS FOR JOINTS

The horizontal and vertical working of Massief NT must be taken into account by creating adequate free space around each panel. The width of the joint must be adjusted to the dimensions of the panel and be at least 8 mm. The actual joint thickness required is calculated with a linear expansion of 2.5 mm/m¹.

The course of the joints must be chosen so that good drainage is possible. Sealing profiles in aluminium, PVC or joint tape may be used on the horizontal and the vertical joints if necessary.

Massief NT external wall cladding

4.7 INSTRUCTIONS FOR VENTILATION

A ventilated continuous air cavity must be present behind the cladding panel with a depth of at least 20 mm. When using horizontal framework that could block the vertical ventilation, ventilation provisions of at least 20 cm² per m¹ must be applied at the top and bottom of the framework.

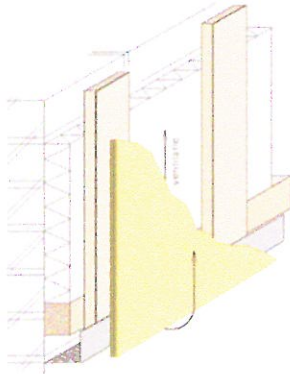


Figure 8

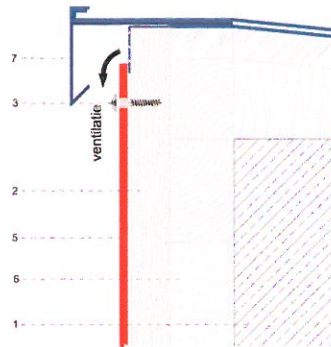


Figure 9

Explanation of figure 9:

1. Roof trim
2. Wooden batten
3. Plastica Torx screw
5. Massief NT
6. Insulation material

4.8 INSTRUCTIONS FOR THE APPLICATION OF THERMAL INSULATION

Processing must be done in accordance with the current state of technology or in accordance with the instructions in a valid quality declaration issued by an institute recognised by the Accreditation Council. The type of insulation and its thickness must be adjusted to the requirements in the Building Decree.

4.9 INSTRUCTIONS FOR DETAILING

- The use of small shims must be avoided.
- Special provisions must be applied where mechanical influences can be expected (for example local application of thicker panels or the use of special profiles for sun screens, ladders etc.).

5. PERFORMANCE

5.1 TECHNICAL BUILDING REGULATIONS FROM A SAFETY POINT OF VIEW

5.1.1 General strength of the structure, Building Decree section 2.1

Building decree, article; parts: 2.2, 2.3 and 2.4; 1a, b, d and 2.

The strength and stability of Massief NT and the certified fastening systems are sufficient to resist the fundamental load combinations occurring in accordance with NEN-EN 1990+NB without yielding for a reference period of 15 years.

Application conditions

1. Static calculations of the external cladding system must conform with NEN-EN 1990+NB taking into account the following points:
 - * The strength calculations for the cladding panels are executed by or on behalf of the manufacturer, and/or in accordance with his written instructions.
 - * The loads that apply for the fire load do not need to be taken into account.
 - * The certified external cladding systems are grouped in the designed lifespan class 3 in accordance with NEN-EN 1990+NB.
 - * The representative values and the material factor Y_m for the support structure are derived from the applicable Eurocode.
 - * A material factor Y_m of 2.0 applies to Massief NT and the fastening materials.
2. Joints, fastenings and anchoring must be executed in accordance with a method such as described in chapter 3.
3. The fastening interval must be determined from case to case in accordance with the selected fastening system (see the instructions in chapter 3).
4. Extra provisions for suspending heavy objects and for use on mechanically extra loadable positions must be made in consultation with the manufacturer.

5.1.2 Limiting the occurrence of a fire risk situation, Building Decree section 2.8

Building decree, article; parts: 2.57.

The incombustibility has not been determined. Provisions must be applied at the site of or near a stovehold and/or the vicinity of a smoke removal device in order to comply with article 2.57 of the Building Decree.

5.1.3 Limitation of the development of fire and smoke, Building Decree section 2.9

Building decree, article; parts: 2.67 and 2.68; 1 to 3

Fire class B can be allocated to Massief NT with a minimum panel thickness of 6 mm in conformity with EN 13501-1.

The smoke class of Massief NT is s2, determined in accordance with EN 13501-1.

Smoke class s2 is only required if the external cladding is indoors (in an atrium or enclosed gallery for instance).

Massief NT external wall cladding

Application conditions

1. *Massief NT may not be applied as such when requirements for 'incombustibility' are set.*
2. *The side of a building's external wall adjacent to inside air (an atrium or enclosed galleries for instance) must consist of building material combinations that comply at least with fire class D and smoke class s2.*
3. *The side of a building's external wall adjacent to outside air must consist of building material combinations that comply at least with fire class D.*
4. *The side of a building's external wall adjacent to outside air from a height of 13 m, must consist of building material combinations that comply at least with fire class B.*
5. *The external wall of a building with a floor intended for persons lying at least 5 m above the measuring level must consist on the side adjacent to the outside air and lying at a height of 2.5 m from the adjoining terrain of building materials that comply with fire class B.*
6. *The fire safety of supporting structures and any insulation material must be assessed from case to case.*

5.1.4 Limiting the spread of fire, Building Decree section 2.10

Building decree, article; parts: 2.84.

No fire-resistant properties relating to fire penetration and flash-over may be accredited to singular Massief NT.

5.2 TECHNICAL BUILDING REGULATIONS FROM A HEALTH POINT OF VIEW

5.2.1 Protection from outside noise - new build, Building Decree section 3.1

Building decree, article; parts: 3.2 and 3.3

No sound-proofing properties may be accredited to singular external cladding panels.

Application conditions

1. *The characteristic sound-proofing between the outside air and an occupied area and between the outside air and an occupied room must be shown case by case by calculations or testing according to NEN 5077 and/or testing by NPR 5070 to be at least 20 dB(A) and at least 18 dB(A).*
2. *Massief NT must be considered as not present when the sound-proofing is determined.*

5.2.2 Resistance to damp, Building Decree section 3.5

Building decree, article; parts: 3.21; 1 to 3 and 3.22

The cladding panels are watertight. The joint and connection details shown in chapter 8 are in principle watertight. The fact that powder snow and rain could penetrate the cavity behind the external cladding now and again must be taken into account.

Application conditions

1. *The materials used must comply with the system specification determined in chapter 3.*
2. *There must be a ventilated cavity behind the cladding panel at least 20 mm deep (see also § 3.4).*
3. *The temperature factor of the inner surface of the external partitioning structure, determined in accordance with NEN 2778 or NPR 2878, is at least 0.65 for houses and residential buildings and at least 0.50 for non-residential buildings.*
4. *The design value of the heat conductivity coefficient (λ) of the materials used must be determined in accordance with NEN 1068.*

5.2.3 Limitation of the presence of hazardous substances and ionising radiation, Building Decree section 3.9

Building decree, article; part: 3.63.

Hazardous and/or aggravating substances or ionised radiation are not expected.

5.2.4 Protection against vermin, Building Decree section 3.10

Building decree, article; part: 3.69.

The protection against vermin is adequate in the executions in accordance with the principle details in chapter 8.

Application condition

Joints, connecting and ventilation openings wider than 1 cm must be provided with closable (ventilation) roosters.

5.3 TECHNICAL BUILDING REGULATIONS FROM AN ENERGY SAVING POINT OF VIEW

5.3.1 Energy efficiency - new build, Building Decree section 5.1

Building decree, article; parts: 5.3, 5.4 and 5.5

The design value for the heat conductivity coefficient (λ) for Massief NT is 0.3 W/(m·K).

An insulation layer must be applied behind the panels if demands have been made on the heat resistance (R_c) of the entire external partitioning structure.

Massief NT is in principle airtight. The principle details shown in this product certificate guarantee airtightness in accordance with NEN 2686.

Application conditions

1. *The heat resistance (R_c) of the total external partitioning structure must be determined in accordance with NEN 1068.*
2. *The design values for the heat conductivity coefficients of the building materials used must be determined in accordance with EN 12667 when they are not already adequately known.*

5.4 OTHER PERFORMANCES

5.4.1 Movement and distortion, BRL 4101 part 1 article 5.4

The deflection to be expected for a fundamental load combination in accordance with NEN 1991-1-1+NB will be less than 1/200 x the distance between the two fastening points.

Massief NT external wall cladding

Application conditions

1. The required panel thickness in relation to the fastening system must be determined case by case in conformity with the processing regulations (see chapter 3).
2. The design regulations must be taken into account.

5.4.2 Resistance to impacts from outside, BRL 4101 part 1 article 5.5

Massief NT panels are resistant to an impact load of 0.9 kNm kinetic energy and are therefore suitable for use as external cladding at ground floor level.

Application condition

The design regulations must be taken into account.

5.4.3 Durability, BRL 4101 part 4 articles 5.3.2 and 5.3.3

Resistance to sulphur dioxide (SO₂)

Massief NT panels are resistant to long-term exposure to SO₂ concentrations which could occur in industrial areas.

Frost-resistance and resistance to UV ageing

The life span of the panels under Dutch climatic conditions is at least 10 years, on the basis of artificial climate changes and ageing tests. Massief NT panels are tested for UV resistance in accordance with BRL 4101-4, § 5.3.3.

Table 5 UV resistance performance

Properties	Values	Unit
Colour fastness	4-5	Grey scale (NEN-ISO A02)
Gloss difference	< 50	%
Blister formation	none	-
Crack formation	5	Class

6. RECOMMENDATIONS FOR THE USER

6.1 When the products stated in the "technical specification" are delivered make sure that:

- the delivery complies with what has been agreed;
- the mark and marking methods are correct;
- the products show no visible defects as a result of transport etc.

6.2 Upon delivery check that the products mentioned under "processing" comply with the specifications stated there.

6.3 If you reject a product on the basis of the above, please contact:

- Plastica Plaat B.V.
- and, when necessary:
- Kiwa Nederland B.V.

6.4 The product must be stored, transported and processed in accordance with the stipulations stated in "processing".

6.5 Take account of the application conditions stated in "performance".

7. BUILDING PRODUCT REGULATIONS

The contents of this KOMO product certificate must not be used to replace the CE marking on that building product and/or to replace the accompanying compulsory performance declaration if an European harmonised technical specification applies to a product.

8. LIST OF DOCUMENTS MENTIONED*

Building Decree	Building Decree 2012 Bulletin of Acts 2011, 416, 676 and the Building Decree Regulations 2012 Bulletin of Acts 2012, 256
DIN 50018	Prüfung im Kondenswasser-Wechselklima mit schwefeldioxidhaltiger Atmosphäre
DIN 67530	Reflektometer als Hilfsmittel zur Glanzbeurteilung an ebenen Anstrich- und Kunststoff-Oberflächen
NEN 1068	Thermal insulation of buildings – Arithmetical methods, inclusive amendment page A5: 2008
NEN 2686	Air permeability of buildings – Measuring method, inclusive amendment page A2: 2008
NEN 2778	Damp-proofing in buildings – Determination methods, inclusive amendment page A4: 2011
NEN 5077	Sound-proofing in buildings – Determination methods for the quantity of sound-proofing in external partitioning structures, contact noise insulation, sound levels caused by installations and echo, inclusive correction page C2: 2011
NEN 5461	Quality requirements for wood (KVH 2000) - Sawn wood and round wood - General section
NEN 5466	Quality requirements for wood (KVH 2010) - European coniferous wood sorted for appearance
NEN 6760	Technical basis for building structures - TGB 1990 - Wooden structures - Basic requirements and methods of determination

Massief NT external wall cladding

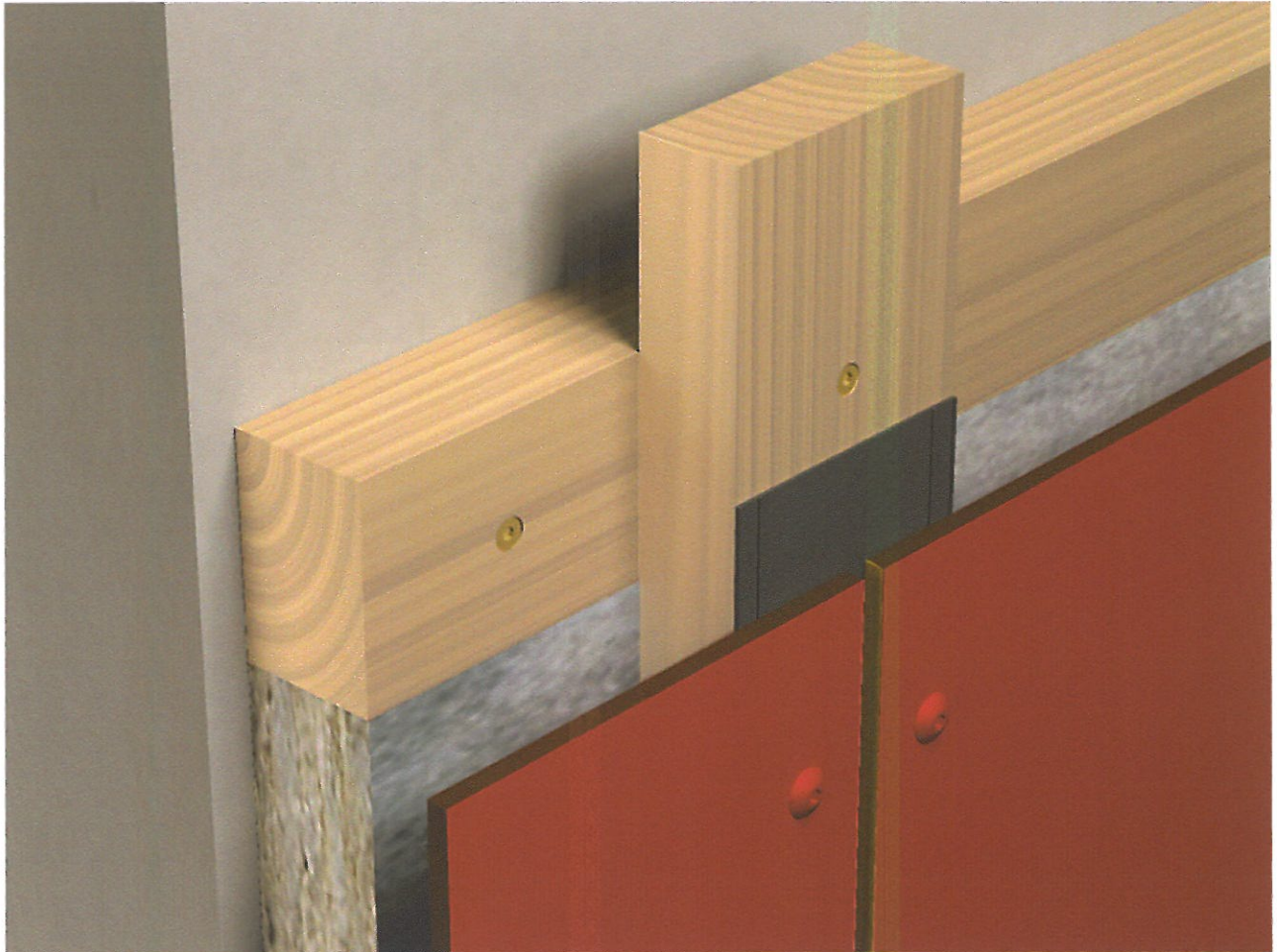
NEN 6762	Steel pin-shaped fastenings for supporting wooden structures
NEN 6068+C1	Determination of the resistance to fire penetration and flash-over between areas
NEN-EN 350-1	Durability of wood and products based on wood - Natural durability of solid wood - Part 1: Guidelines for the principles of testing and classifying the natural durability of wood
NEN-EN 438-2	Decorative high-pressure laminated panel (HPL) - Panels based on thermosetting resin (often called laminate) - Part 2: Determination of the properties
NEN-EN 438-7	Decorative high-pressure laminate (HPL) - Panels based on thermosetting resin (usually called laminate) - Part 7: Compact laminate and composite panels from HPL for walls and ceilings inside and outside
NEN-EN 1990+A1+A1/C2	Eurocode – Basis for the structural design, inclusive national annex NB:2011
NEN-EN 1991-1-4+A1+C1:2011	Eurocode 1: Loads on structures – Part 1-4: General loads – Wind load, inclusive national annex NB:2011
NEN-EN 1995-1-1+C1+A1	Eurocode 5: Design and calculation of wooden structures – Part 1-1: General - Common regulations and regulations for buildings, inclusive national annex NB:2011
NEN-EN 12667	Thermal properties of building materials and products - Determination of the heat resistance according to the method with covered "hot plate" and the method with heat flow meter - Products with average and high heat resistance
NEN-EN 13501-1+A1	Fire classification of building products and building components – Part 1: Classification based on the results from testing fire behaviour
NEN-EN-ISO 178	Plastics - Determination of the bending properties
NEN-EN-ISO 527-2:	Plastics - Determination of the tensile properties - Part 2: Testing conditions for compressed, die-cast and extruded plastics
NEN-EN-ISO 1183-1:	Plastics - Methods for determining the density of non-foaming plastics - Part 1: Immersion method, fluid pycnometer method and titration method
NEN-ISO 105-A02	Textiles - Testing the colour fastness - Part A02: Grey scale for determining the changes in colour
NPR 2652	Waterproofing in buildings - Exclusion of external moisture and exclusion of internal moisture - Examples of architectural details
NPR 2878	External partitioning structures on buildings - Simplified calculation method for the inside surface temperature factor
NPR 5070	Sound-proofing in residential buildings - Examples of walls and floors in stone bearing structures
BRL 0601	Wood preservation
BRL 0602	Fire-retarding treatment for wood and wood products by means of the vacuum and pressure method
BRL 0605	Modified wood
BRL 4101 -1	External wall cladding with panels Part 1: General requirements
BRL 4101 -4	External wall cladding with panels Part 4: Requirements for decorative panels based on thermosetting resin
BRL 4101 -7	External wall cladding with panels Part 7: Adhesive for fastening external cladding panels

* The latest version of BRL 4101 part 1 and part 4 is referred to for the correct version of the standards mentioned

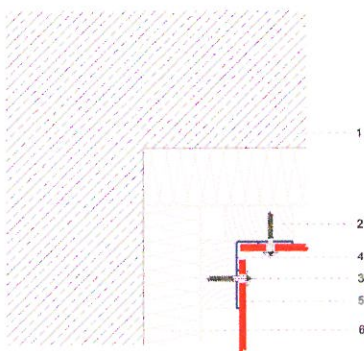
Massief NT external wall cladding

9. PRINCIPLE DETAILS

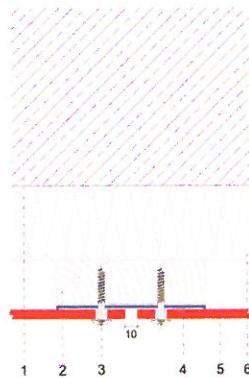
9.1 FASTENING WITH SCREWS



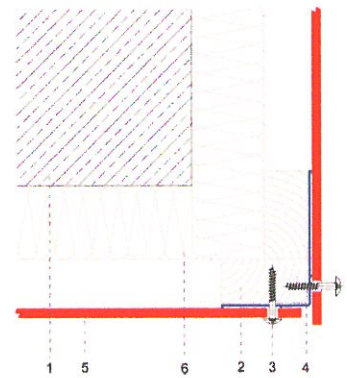
Fastening with screws



Horizontal cross-section
internal corner joint, screwed



Horizontal cross-section
connecting batten, screwed



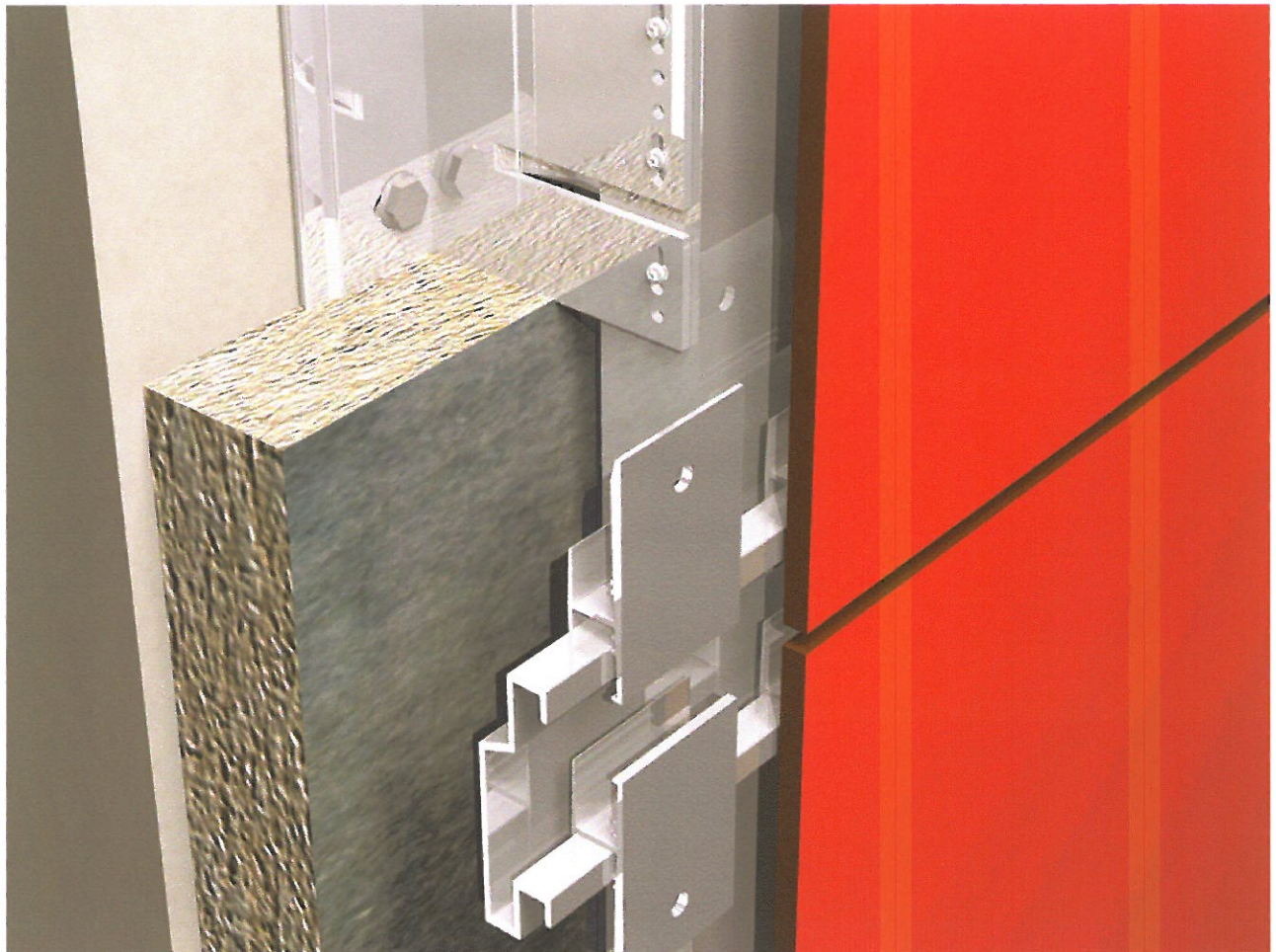
Horizontal cross-section
external corner joint, screwed

- 1. External wall structure behind
- 2. Wooden batten
- 3. Plastica Torx screw

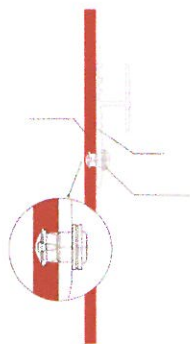
- 4. Joint tape
- 5. Plastica Massief NT
- 6. Insulation material

Massief NT external wall cladding

9.2 BLIND FASTENING

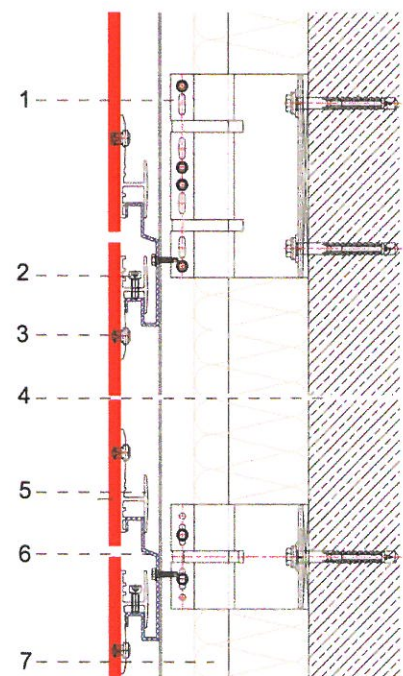


Blind fastening



Blind suspension system, collar plug detail

1. Plastica blind suspension system, wall support
2. Adjusting screw
3. Collar plug
4. External wall structure behind
5. Plastica blind suspension system, adjustable wall hook
6. Plastica blind suspension system, horizontal bearing profile
7. Insulation material



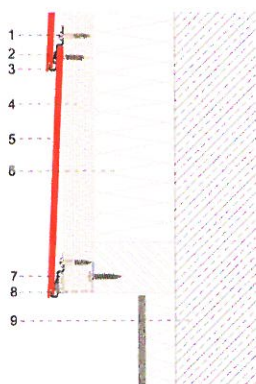
Blind suspension system, vertical cross-section

Massief NT external wall cladding

9.3 WEATHERBOARDING



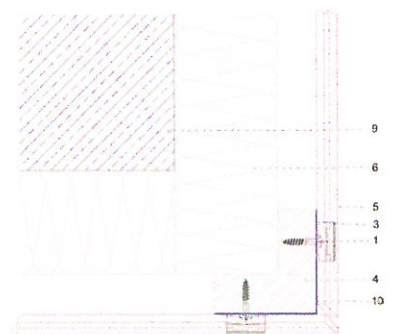
Weatherboarding



Weatherboarding inclusive start profile



Horizontal cross-section connecting batten, screwed



Horizontal cross-section external corner joint, screwed

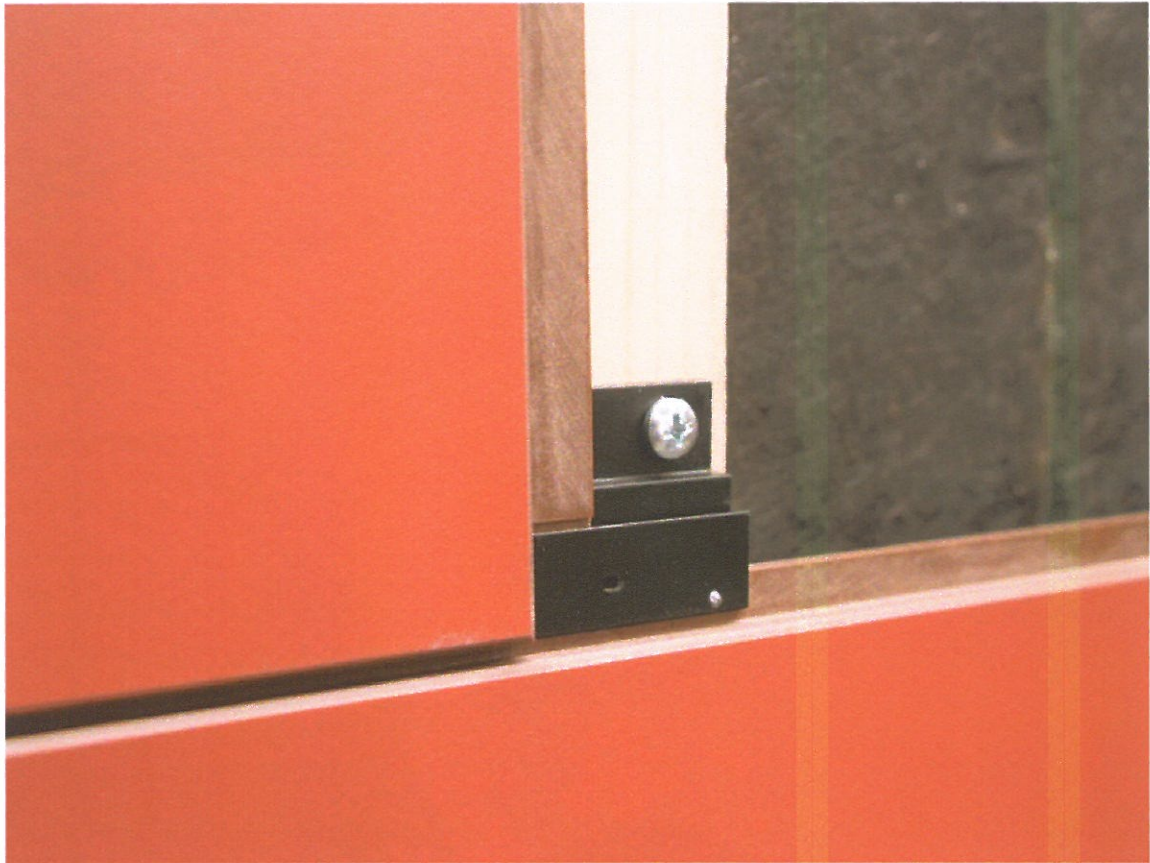
- 1. Plastica Torx screw
- 2. Plastica weatherboard panel
- 3. Plastica assembly clamp
- 4. Wooden batten

- 5. Plastica weatherboard panel
- 6. Insulation material
- 7. Plastica Massief NT
- 8. Plastica assembly clamp

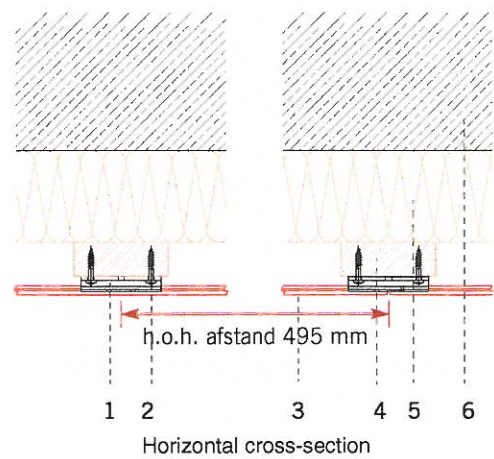
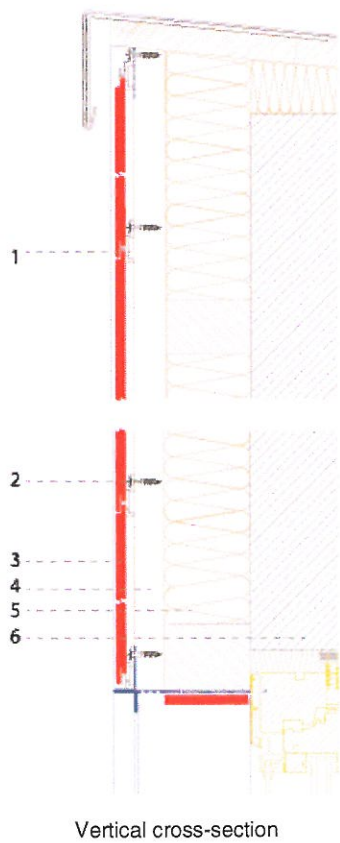
- 9. Facade structure behind
- 10. EPDM foil
- 11. Joint profile

Massief NT external wall cladding

9.4 MODULO



Modulo ME05



1. Fastening profile
2. Screw
3. Massief NT Modulo ME05 panel
4. Wooden framework
5. Insulation material
6. External wall structure behind