MODULO Façade System

MODULO TECHNICAL AND INSTALLATION GUIDE

USA/CAN EDITION — APRIL 2023

EXTERIOR

Fundermax

Fundermax North America, Inc. | (980) 299-0035 | office.america@fundermax.biz | www.fundermax.com

Success Lies in the Right System

With the Modulo Rainscreen Cladding systems, Fundermax offers panels, mounting system and all the necessary accessories from a single source. Thus, you not only efficiently save time with your purchase and installation, you can also be confident that you will receive impact resistant, attractive, durable and UV resistant panels and accessories with proven Fundermax quality.

MODULO – CONCEALED FASTENING SYSTEM

Design Meets Tradition

MODULO is a concealed fastening system that can easily be installed on wood or aluminum substructures. The unique system design and attractive décor possibilities lend themselves to new accents and visual interest in your facades.

MAX EXTERIOR FACADE PANELS
Sensational decor designs with an enormous spectrum of styles, including rough urban, vibrant solid colours and the wild beauty of a broad range of natural materials.

What Max Compact Exterior Can Do

Modulo is offered as cost effective “system solutions” that incorporate mounting clips, trims and panels, that are pre-fabricated to facilitate aesthetics and ease of installation. Fundermax Exterior Panels are the perfect choice for these two unique façade systems! The panels are duromer high-pressure laminates (HPL) designed for exterior applications. They are produced in accordance with EN436-6 Type EDF under high pressure and temperature. The front and back panel surfaces are protected with a double-hardened, acrylic polyurethane resin saturation process. This provides protection to weathering and superior UV resistance, even in the harshest of climates, making it the perfect solution for durable and aesthetically appealing façade cladding that will pass the test of time.

EXTREMELY WEATHER RESISTANT

OPTIMAL LIGHT-FASTNESS

DOUBLE HARDENED

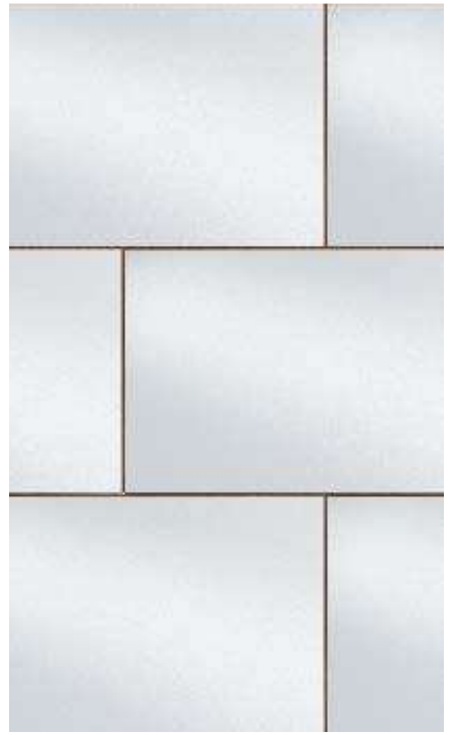
SCRATCH RESISTANT

SOLVENT RESISTANT

EASY TO CLEAN

IMPACT RESISTANT

EASY TO INSTALL



PROPERTIES*:

- Weather resistant to EN ISO 4892-2
- Lightfast acc. to EN ISO 4892-3
- Double hardened
- Scratch resistant
- Solvent resistant
- Hail resistant
- Easy to clean
- Impact resistant EN ISO 178
- Suitable for all exterior applications
- Decorative
- Bending resistant EN ISO 178
- Frost and heat resistant
- Constant temperature load -80 °C to 80 °C
- Easy to install

*STANDARD- AND ACTUAL-VALUES YOU WILL FIND ON OUR WEBSITE WWW.FUNDERMAX.COM

MODULO: The concealed fastener, closed joint modern façade system from Fundermax

ADVANTAGES OF MODULO

- NFPA285 compliant assembly options
- Concealed fastening
- Closed joints
- Proven quality
- Abrasion resistant
- Impact and hail resistant
- Double-sided, balanced panels
- Weather resistant
- UV stable
- Ease of machining
- Ease of installation
- Minimal maintenance
- Ease of cleaning (non porous)
- Wide range of decors
- Quick ship program

NOTE
CUSTOM PANEL HEIGHTS BETWEEN 6" AND 24" AVAILABLE UPON REQUEST

MODULO FAÇADE SYSTEM

This modern façade fastening system with high design décor offerings makes it possible to install pre-fabricated panels on a concealed clip system without any open joints vertically or horizontally. The panels can be installed in a stacked bond, running bond or a hybrid of both to create a façade with inspired visual interest. The substructure can be wood or aluminum, and can accommodate exterior insulation.

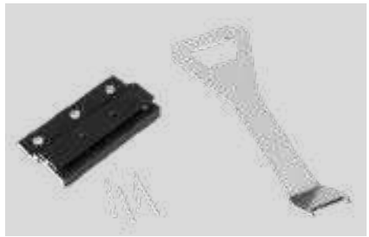
Note: Information about building regulation permits can be found at our website https://fundermax.us/code-compliance-and-testing/

DESIGN: LITTLE DIVERSIFIED ARCHITECTURAL CONSULTANTS, DURHAM

Fundermax

INFORMATION MODULO PANEL	
MODULO 2X2	
Format	24 x 24 in
Surface Coverage not including joint	23,92 x 23,92 in
Minimum order quantity = 1 package = 6 panels (or a multiple)	24 sf
Panel thickness	0.31 in
Surface coverage / package	23,82 sf
Surface coverage / panel	3,97 sf
MODULO 2X4	
Format	48 x 24 in
Surface Coverage not including joint	47,92 x 23,92 in
Minimum order quantity = 1 package = 6 panels (or a multiple)	48 sf
Panel thickness	0.31 in
Surface coverage / package	47,7 sf
Surface coverage / panel	7,95 sf
PHYSICAL DATA/PROPERTIES	
Artificial weathering EN ISO 4892-2	4-5
Fire Testing Data	Class A Rated per ASTM E84 See page 27 for more info

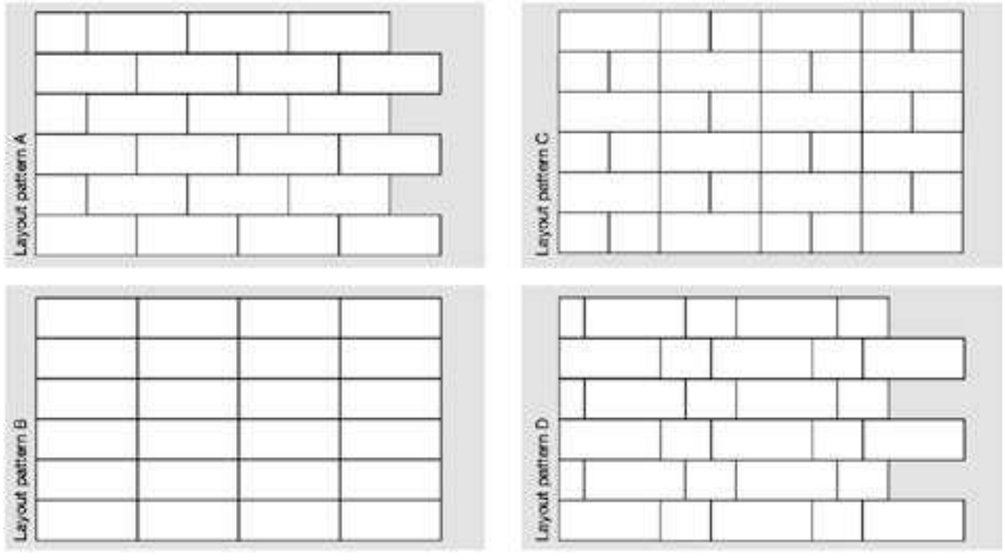
MODULO ACCESSORIES	
Mounting clip	100 pcs/unit
Mounting track (L=118.11 in)	10 pcs/unit



ACCESSORIES: FASTENER; LOCKING PIN; ASSEMBLY AID

LAYOUT PROCEDURES OF MODULO

By choosing this layout procedure — and the selection of the décor or varying decors — you have many design possibilities.
Note: The arrangement of sheet sizes can significantly influence time and effort required for the substructure. For joints lying vertically one atop the other, particularly careful work is necessary.

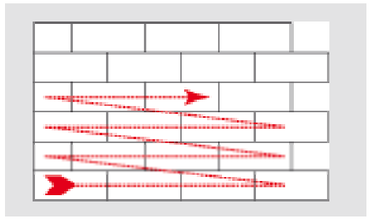


Assembly

1. PREPARATION
To achieve a visually appealing facade and minimize waste, prior to commencing assembly it is recommended to draw up an exact plan of the façade view based on field measurements. Pay attention to fitting pieces for windows, doors or corners at either end. Do not forget the inner faces of windows and doors when determining the materials to be used. You can also use any cut offs on the next course.

2. SUBSTRUCTURE PREPARATION
As a matter of principle, local building regulations are to be followed in all cases. Pay attention to the hints in our brochure “Exterior Technique”. The wooden substructure has to be constructed according to the national standards (wood moisture 15%±3).

Pay attention to chemical or constructive wood preservation!



The basic prerequisite for perfect assembly of the façade system Modulo is a professional, precisely aligned sub-structure.

The vertical battens need to be at least 2 3/4" wide to receive the Modulo clip.

In the selection of using façade screws we recommend pre-drilling of the wooden substructure according to the directions of the screw manufacturer.

The wooden substructure battens have to be protected permanently against moisture by an UV- and weather-resistant EPDM protective tape, which is minimum 0.05 inch thick. It is also possible to use an aluminum substructure. The average distance for the standard lengths of 24/48 inch is 16" on-center. For special lengths, please determine this distance yourself.

Due to the system's rabbeting, we recommend beginning assembly at the bottom left. In general, the assembly of all façade parts, including the window boards, must begin simultaneously with the façade assembly and be performed from the bottom to the top.

3. ASSEMBLY OF THE FIRST ROW
Once the substructure has been precisely assembled and the necessary metal covering work performed, mount first the the Modulo clips. These must be aligned horizontally very precisely. All further rows are mounted with Modulo fasteners.

4. ASSEMBLY OF THE FIRST MODULO ELEMENTS
Set the Modulo elements on top of the substructure beginning at the lower left (with the groove facing downwards). Prior to screwing on the upper bracket, the assembly aid must be inserted into both of the holes in the fastener. This guarantees that the sheet will have sufficient vertical clearance. Screw each fastener tightly onto the substructure using two facade screws (at least #12 Screw), 0.19 x 1.18 inch.

In certain applications the modulo clip may need to be drilled to receive the installation screw.

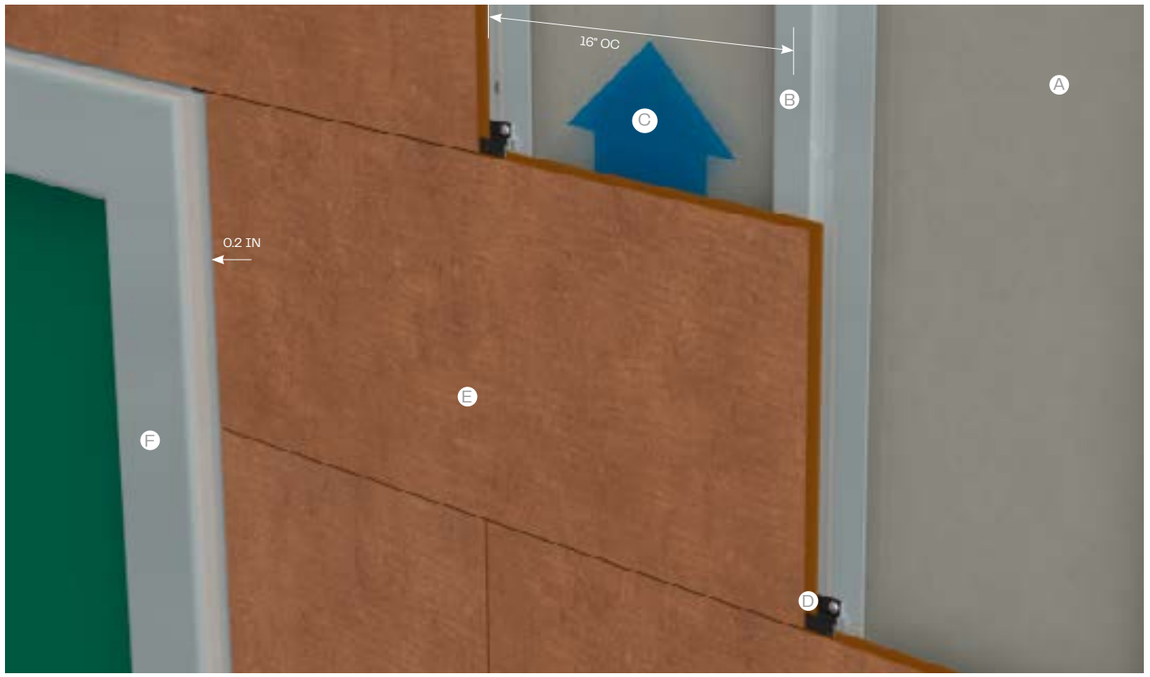
5. ASSEMBLY OF THE NEXT MODULO ELEMENT
Screw the second element to the first one at a distance of 0.08 inch. Use the assembly aid to determine the distance. After screwing on the second element and checking the distance, drill through the Modulo element at the upper left fastener in the hole provided and affix the element to the substructure using the supplied locking pin. The element is thereby secured against lateral shifting.

6. CUTS TO FIT/LATITUDE
Continue assembly of the façade in this fashion. Cut the right side to fit, as needed. Please always heed a latitude of at least 0.2 inch to the other construction parts.

7. CONCLUDING ASSEMBLY
For upper or lower cuts to fit, the sheet is to be fastened visibly with façade screws or façade rivets with an appropriate grip of rivet (from 0.75 inch plus, e.g. 0.2 x 0.98 inch rivet). For shimming to the substructure, please use off-cuts from the Modulo elements (fasteners are 0.31 inch thick, sheet off-cuts are likewise 0.31 inch thick).

NOTICE
SUPPLIERS FOR FURTHER ACCESSORIES AND GENERAL WORKING INSTRUCTIONS CAN ALSO BE FOUND IN OUR BROCHURE "TECHNIQUE EXTERIOR". PLEASE CONTACT YOUR LOCAL SALES REPRESENTATIVE FOR FURTHER ACCESSORIES COMPLIMENTARY TO THE MODULO SYSTEM

Basic Design of a MODULO Façade



MODULO FAÇADE SYSTEM

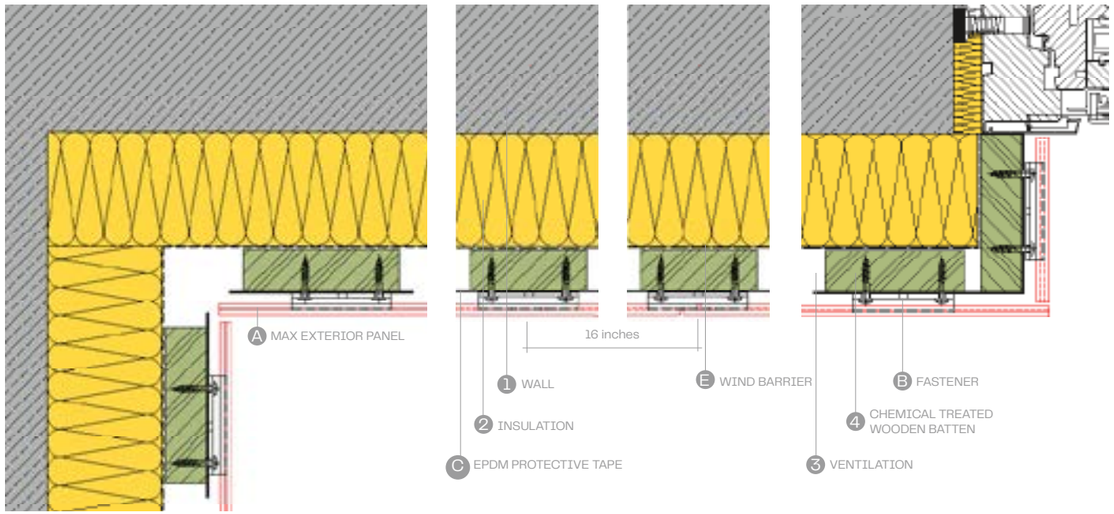
LEGEND

A WALL
B SUBSTRUCTURE
C VENTILATION
D MOUNTING CLIP
E MODULO ELEMENT
F BUILDING ELEMENTS LIKE WINDOWS/ DOORS OR WALL SOCKETS

PHOTOGRAPHER: DAVID BOUREAU

ARCHITECT: BRIAN AMARAL | ANALOGUE STUDIO, LLC

Construction-details horizontal sections
MODULO Façade System on wooden substructure

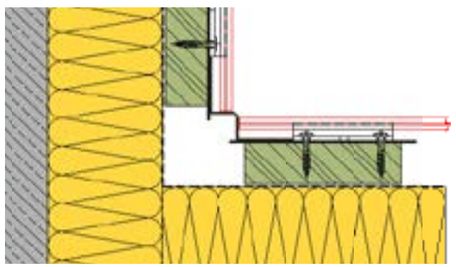


INTERNAL CORNER A106

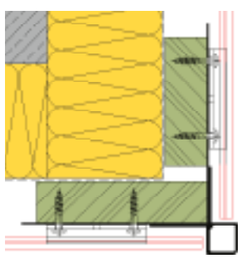
INTERMEDIATE SUPPORT A108

VERTICAL JOINT A107

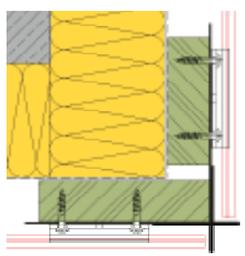
WINDOW REVEAL A104



INTERNAL CORNER A106 WITH PROFILE



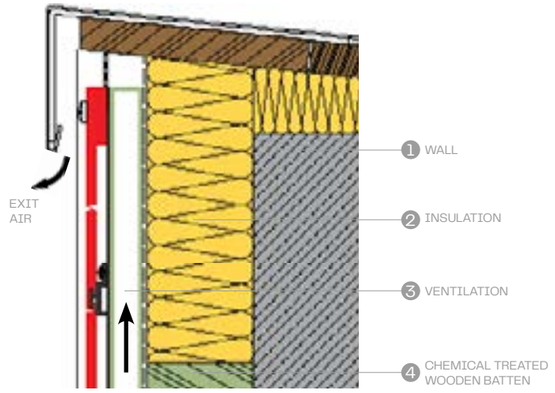
EXTERNAL CORNER A105 WITH SQUARE PROFILE



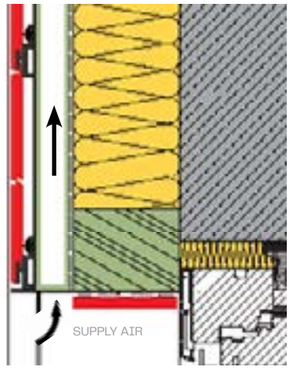
EXTERNAL CORNER A105 WITH CROSS PROFILE

NOTE
MINIMUM 1.2 MM THICK EPDM TAPE IS RECOMMENDED ON ALL WOOD SUBSTRUCTURE, RETURNING BACK 3/8" ON BOTH SIDES.
ALL THE SHOWN PROFILES AND FASTENINGS (EXCEPT THE FASTENING CLIP AND CORNER PROFILES) ARE PLANNING-SUGGESTIONS AND NOT PART OF THE FUNDERMAX DELIVERY PROGRAMME.
ALL DRAWINGS IN THIS BROCHURE ARE NOT TRUE TO SCALE.
CAD-DETAILS ARE AVAILABLE IN THE DOWNLOAD SECTION OF THE FUNDERMAX WEBSITE: HTTPS://FUNDERMAX.US/SYSTEM-DETAILS/

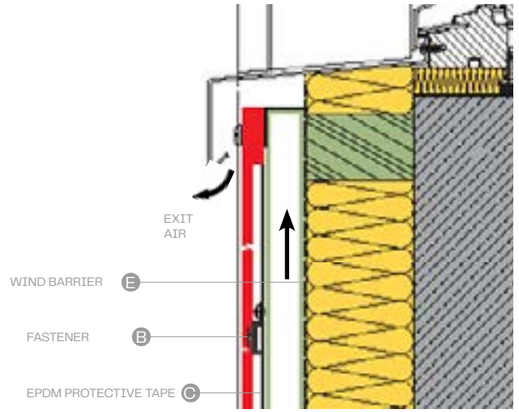
Construction-details vertical sections
MODULO Façade System on wooden substructure



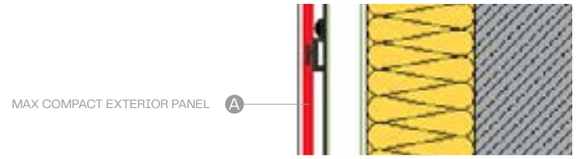
ATTIC CONNECTION A109



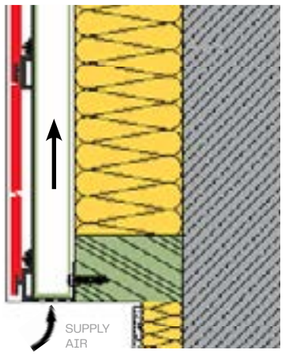
WINDOW LINTEL A101



WINDOW SILL CONNECTION A102

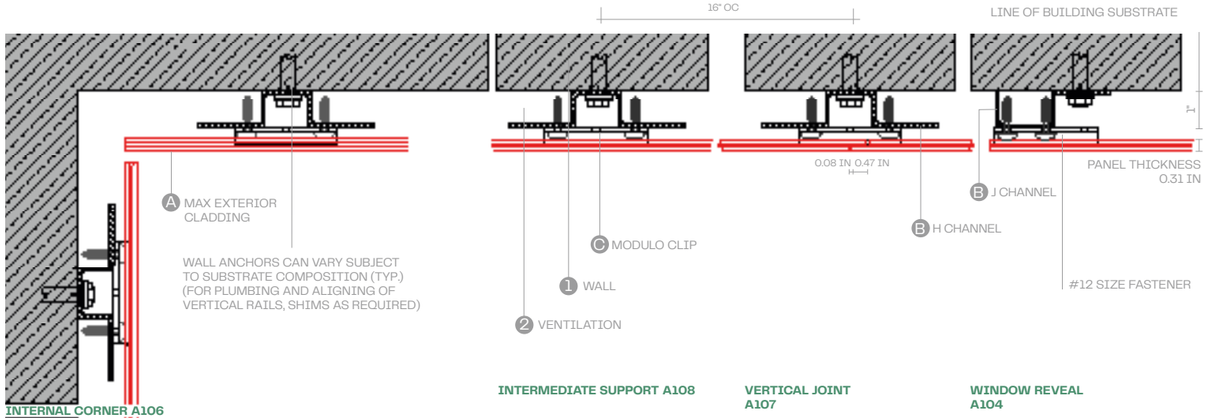


HORIZONTAL JOINT A110

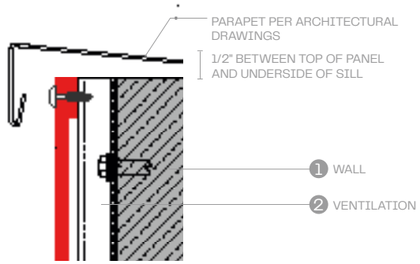


BASE CONNECTION A103

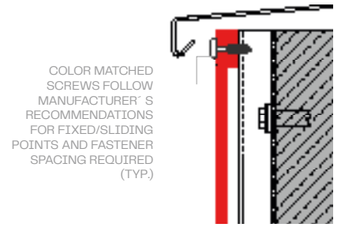
Construction-details horizontal sections
MODULO Façade System on aluminum-substructure

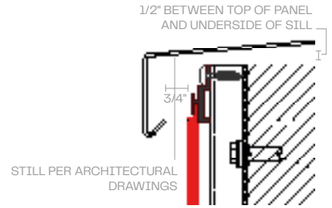


Construction-details vertical sections
MODULO Façade System on aluminum-substructure

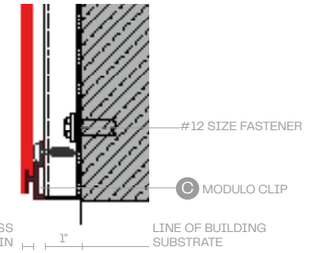


ATTIC CONNECTION
A109

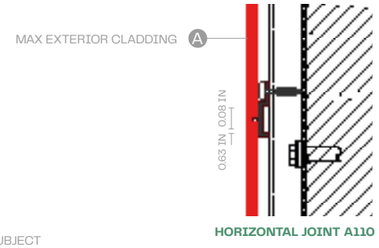




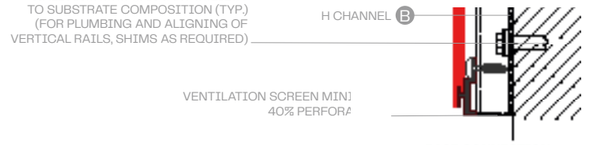
WINDOW SILL CONNECTION
A102



WINDOW LINTEL
A101



HORIZONTAL JOINT A110



BASE CONNECTION
A103

NOTE
ALL THE SHOWN PROFILES AND FASTENINGS (EXCEPT THE FASTENING CLIP) ARE PLANNING-SUGGESTIONS AND NOT PART OF THE FUNDERMAX DELIVERY PROGRAMME.
ALL DRAWINGS IN THIS BROCHURE ARE NOT TRUE TO SCALE!

Fire Testing Data

List of the tests/results with qualifications and requirements for NFPA285 assemblies

- ASTM E84 – Class A Rating (FSI = 15, SDI = 70)
- ASTM D 1929 = Pass (Self Ignition Temperature Greater than 650 degrees Celsius)
- NFPA 268 – Surface Ignition Test = Pass
- NFPA 285 – Intermediate Scale Multi Story Apparatus Test = Pass*

THIS IS AN ASSEMBLY TEST, FOR ASSEMBLIES THAT ARE NFPA285 COMPLIANT. SEE DETAILS AND NOTES FOR OPTIONS.

FOR NFPA285 COMPLIANT ASSEMBLIES:

Base wall to be minimum 18 gauge metal stud framing with 5/8" gypsum sheathing both sides, concrete, or CMU. For these assemblies, panels must be mounted over extruded aluminum mounting systems. Weather resistive barriers can be chosen from the list below based on the amount of exterior mineral wool insulation used in the design. Note that walls not using exterior insulation are also NFPA285 compliant when WRB's from the list below under "Less than 2" of Insulation" are used.

WEATHER RESISTIVE BARRIER OPTIONS FOR NFPA285 ASSEMBLIES

LESS THAN 2-INCH LAYER OF MINERAL WOOL

SUPPLIER	WATER-RESISTIVE BARRIER PRODUCTS
Prosoco	R-Guard Spray Wrap, R-Guard MVP
Dupont	Tyvek, Tyvek Commercial
VaproShield	WrapShield (Green), Reveal Shield, Wrap Shield (Orange; as tested)
Pactive GreenGuard	C500, C200, RainDrop 3D, Classic Wrap
Cosella Dorken	Delta-Vent S/Plus, Delta-Foxx/Plus, Delta-Maxx/Plus
3M	Self-Adhered AVB Membrane 3015
Davis Wire	Building Paper
Mid-State	Building Paper
Hohmann & Barnard	Enviro Barrier VP (15 mils DFT)

2-INCH OR THICKER LAYER OF MINERAL WOOL

Any WRB can be used including asphaltic, butyl based products.

MINERAL INSULATION REQUIREMENTS FOR WALLS USING EXTERIOR INSULATION:

- The mineral wool must meet the requirements of ASTM C612.
- The mineral wool shall not have any type of facer (foil, etc.) on either side.
- The mineral wool shall be non-combustible via ASTM E 136 testing;
- The R value of the mineral wool shall be a minimum of 2.0.
- The mineral wool insulation must be securely attached to the wall system by either being mechanically attached back to the base wall assembly using insulation pins or equivalent or friction fit within the exterior wall assembly cladding rail system.
- The density of the mineral wool must be a minimum of 4lbs per cubic foot.

Technical Properties Datasheet

FUNDERMAX MAX COMPACT EXTERIOR, F QUALITY, NT SURFACE

PROPERTIES	TEST METHOD	STANDARD VALUE	
MECHANICAL PROPERTIES			
Panel Core		Standard Dark Brown Core, Finish on both sides	
Porosity		Non Porous surface and edges	
Antimicrobial Characteristics		Fundermax panels do not support microorganic growth	
Modulus of Elasticity	property tested according to ES 438.2	≥ 9000 N/mm²	≥ 1,305,340 psi
Tensile Strength	property tested according to ES 438.2	≥ 80 N/mm²	≥ 11,603 psi
Flexural Strength	property tested according to ES 438.2	≥ 90 N/mm²	≥ 13,053 psi
Density	Per EN ISO 1183-1	1.35 g/cm³	1 N/mm² = 1MPa
Surface Impact Resistance	Falling ball test per EN 438-2:21, (standard value ≤ 10 mm)	≤ 10 mm	
Scratch Resistance	Per EN 438-2:25	4-6 N	4 N = .9 lbf
Abrasion Resistance	1 U = 1 cycle of rotation, property as tested per ES 438.2	≤ 450 U	
Color Stability – Artificial Weathering inlc. Lightfastness	Per EN ISO 4892-2, industry standard ≥ 3	Greyscale value 4–5	
Resistance to Fixings – Pullout Strength ISO		≥ .3937 in	≥ 4000 N

PROPERTIES	TEST METHOD	STANDARD VALUE
FIRE BEHAVIOR		
Burning Classification	As tested per ASTM E84	Class A rating
PANEL THICKNESS		**8 mm**
FSI (Flame Spread Index)	As tested per ASTM E84	15
SDI (Smoke Develop Index)	As tested per ASTM E84	70

PROPERTIES	TEST METHOD	STANDARD VALUE	
MECHANICAL PROPERTIES			
Thermal Conductivity			0.3 W/mK
Water Vapor Diffusion Resistance			ca. 17.200 ‖
Dimensional Changes during climatic	Dimensional Stability per EN 438-2:17	I %	0.1
Changes, measured at elevated temperatures		Q %	0.25
Dimensional Tolerance of Nominal Sizes			(+10 mm / - 0 mm)
Dimensional Tolerance of Thicknesses		+/- .5 mm	≤ 12 mm
Resistance to Chemicals	Fundermax panels are highly resistant to many chemicals, complete list available on request		
Ease of maintenance/Cleaning	Fundermax panels resist dirt, easily cleaned with common agents, complete list available		

SEE FUNDERMAX ICC ESR #3340 FOR ICC AC92 COMPLIANCE (NFPA285 ASSEMBLIES, AND ALL OTHER IBC CODE PRESCRIBED TESTS)

NOTE
VALUES ARE AVERAGE VALUES.

Fundermax Modulo Custom Sizing in Plank Formats

Fundermax Modulo can be manufactured and installed in plank formats within the following size range;

Minimum Height = 6”
Maximum Height = 24”
Any length is possible within Fundermax’s standard panel offering.

Joints on the long axis with the Modulo Machined Edge for clip installation will always be 2 mm.
Short Joints at panel to panel ends must be spaced per the following:

Panels 4–6 ft (1219 to 1829 mm) = 4 mm joint (5/32 in)

Panels 6–10 ft (1829 to 3048 mm) = 6 mm joint (1/4 in)

Panels 10 ft + (3048 mm +) = 8 mm joint (5/16 in)

Modulo Custom Sizes will come with Square cut ends and Modulo Grooves on each long edge for clip installation unless specified otherwise. Shipping with Square cut ends at the ends allows the panels to be field cut to length and can expedite the order process.

Fundermax Modulo may also be installed in vertical orientation, please contact us for installation details for this custom application

Windload for Modulo in Plank Formats

PANEL SIZE: 6" FASTENED TO H AND J SHAPED EXTRUSION

NO. OF FASTENERS PER CLIP	NOMINAL SIZE OF FASTENER	16IN SPACING ALLOWABLE WIND PRESSURE (PSF)	32IN SPACING ALLOWABLE WIND PRESSURE (PSF)
2	#12	192.2	95.0
3	#12	225.3	111.6

PANEL SIZE: 8" FASTENED TO H AND J SHAPED EXTRUSION

NO. OF FASTENERS PER CLIP	NOMINAL SIZE OF FASTENER	16IN SPACING ALLOWABLE WIND PRESSURE (PSF)	32IN SPACING ALLOWABLE WIND PRESSURE (PSF)
2	#12	143.6	70.7
3	#12	168.4	83.1

PANEL SIZE: 12" FASTENED TO H AND J SHAPED EXTRUSION

NO. OF FASTENERS PER CLIP	NOMINAL SIZE OF FASTENER	16IN SPACING ALLOWABLE WIND PRESSURE (PSF)	32IN SPACING ALLOWABLE WIND PRESSURE (PSF)
2	#12	95.0	46.4
3	#12	111.6	54.7

TECHNICAL INFORMATION

- Chart utilizes AAMA TIR-A9-14 (Table 22.10 for allowable pullout of #12 screw in 3 mm 6063-T5 Aluminum)
- Aluminum and wood members and corresponding connection to substrate must be engineered by others
- Maximum Horizontal Spacing of Vertical Supports is 32"
- Maximum Panel Height is noted on tables
- Maximum Panel Windload Deflection used is L/60 of panel length or 1", which-ever is smaller
- These values are design guidelines only and not a substitute for project specific calculations

PANEL SIZE: 6"
FASTENED TO SPF WOOD BATTEN

NO. OF FASTENERS PER CLIP	NOMINAL SIZE OF FASTENER	MINIMUM FASTENER PENETRATION (IN.)	16" CLIP SPACING ALLOWABLE WIND PRESSURE (PSF)	32" CLIP SPACING ALLOWABLE WIND PRESSURE (PSF)
2	#12	1.0	62.7	32.5
2	#12	1,5	97.1	46.4
2	#12	2.0	127.7	64.9
3	#12	1.0	95.2	46.5
3	#12	1.5	143.5	70.6
3	#12	2.0	192.6	95.2

PANEL SIZE: 8"
FASTENED TO SPF WOOD BATTEN

NO. OF FASTENERS PER CLIP	NOMINAL SIZE OF FASTENER	MINIMUM FASTENER PENETRATION (IN.)	16" CLIP SPACING ALLOWABLE WIND PRESSURE (PSF)	32" CLIP SPACING ALLOWABLE WIND PRESSURE (PSF)
2	#12	1.0	46.5	22.1
2	#12	1,5	70.6	34.2
2	#12	2.0	95.2	46.5
3	#12	1.0	70.8	34.3
3	#12	1.5	107.1	52.4
3	#12	2.0	143.9	70.8

PANEL SIZE: 12"
FASTENED TO SPF WOOD BATTEN

NO. OF FASTENERS PER CLIP	NOMINAL SIZE OF FASTENER	MINIMUM FASTENER PENETRATION (IN.)	16" CLIP SPACING ALLOWABLE WIND PRESSURE (PSF)	32" CLIP SPACING ALLOWABLE WIND PRESSURE (PSF)
2	#12	1.0	30.3	14
2	#12	1,5	46.4	22.1
2	#12	2.0	62.7	30.3
3	#12	1.0	46.5	22.1
3	#12	1.5	70.6	34.2
3	#12	2.0	95.2	46.5

TECHNICAL INFORMATION

- Chart uses #12 wood screw with min. penetration shown in tables
- Aluminum and wood vertical members and corresponding connection to substrate must be engineered by others
- Wood is assumed to be Spruce-Pine-Fir Species with Specific Gravity , G=0.42
- Maximum Horizontal Spacing of Vertical Supports is 32"
- Maximum Panel Height is noted on tables
- Maximum Windload Deflection used is L/60 of panel length or 1", whichever is smaller
- These values are design guidelines only and not a substitute for project specific calculations

Windload for Modulo 24"

PANEL SIZE: 24"
FASTENED TO H AND J SHAPED EXTRUSION

NO. OF FASTENERS PER CLIP	NOMINAL SIZE OF FASTENER	16IN SPACING ALLOWABLE WIND PRESSURE (PSF)
2	#12	33.0
3	#12	48.0

PANEL SIZE: 24" – SPF WOOD BATTEN*

NO. OF FASTENERS PER CLIP	NOMINAL SIZE OF FASTENER	MINIMUM FASTENER PENETRATION (IN.)	16" CLIP SPACING ALLOWABLE WIND PRESSURE (PSF)
2	#12	1.0	16.2
2	#12	1,5	24.3
2	#12	2.0	32.5
3	#12	1.0	24.3
3	#12	1.5	36.4
3	#12	2.0	48 (note 8)

WOOD BATTENS ONLY ALLOWABLE FOR INSTALLED HEIGHTS BELOW 40¨ .

TECHNICAL INFORMATION

- Chart utilizes AAMA TIR-A9-14 (Table 22.10 for allowable pullout of #12 screw in 1/8" 6063-T5 alum.)
- Chart utilizes #12 wood screw with minimum wood penetration shown.
- Wood is assumed to be spruce-pine-fir species with specific gravity, G ≥ 0.42.
- Aluminum and wood verticals and corresponding connection of verticals to substrate beyond must be engineered by others.
- Maximum horizontal on-center spacing of vertical panel supports is 16".
- Maximum panel height is 24".
- Maximum panel wind load deflection used is L/60 of panel length or 1", whichever is smaller.
- Maximum allowable wind load pressure is 48 psf per panel P2.

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