MASTER PANEL

Insulated metal panels

MASTER PANEL S.L. was created in 2007, based on our group's 40 years experience in the metal structure sector. We specialise in the manufacturing of polyurethane (PUR) and polyisocyanurate (PIR) insulated metal panels for the construction industry, and have extensive modern facilities with the most advanced technology in our sector.

Our panels bring together current architectural trends with the most demanding functional requirements, meeting the needs of any type of enclosure: roofs, walls, cold rooms, suspended ceilings and partitions. We have a wide range of over 30 panels suitable for different construction sectors: industrial, commercial, residential, modular, agricultural and the refrigeration industry (agri-food sector).

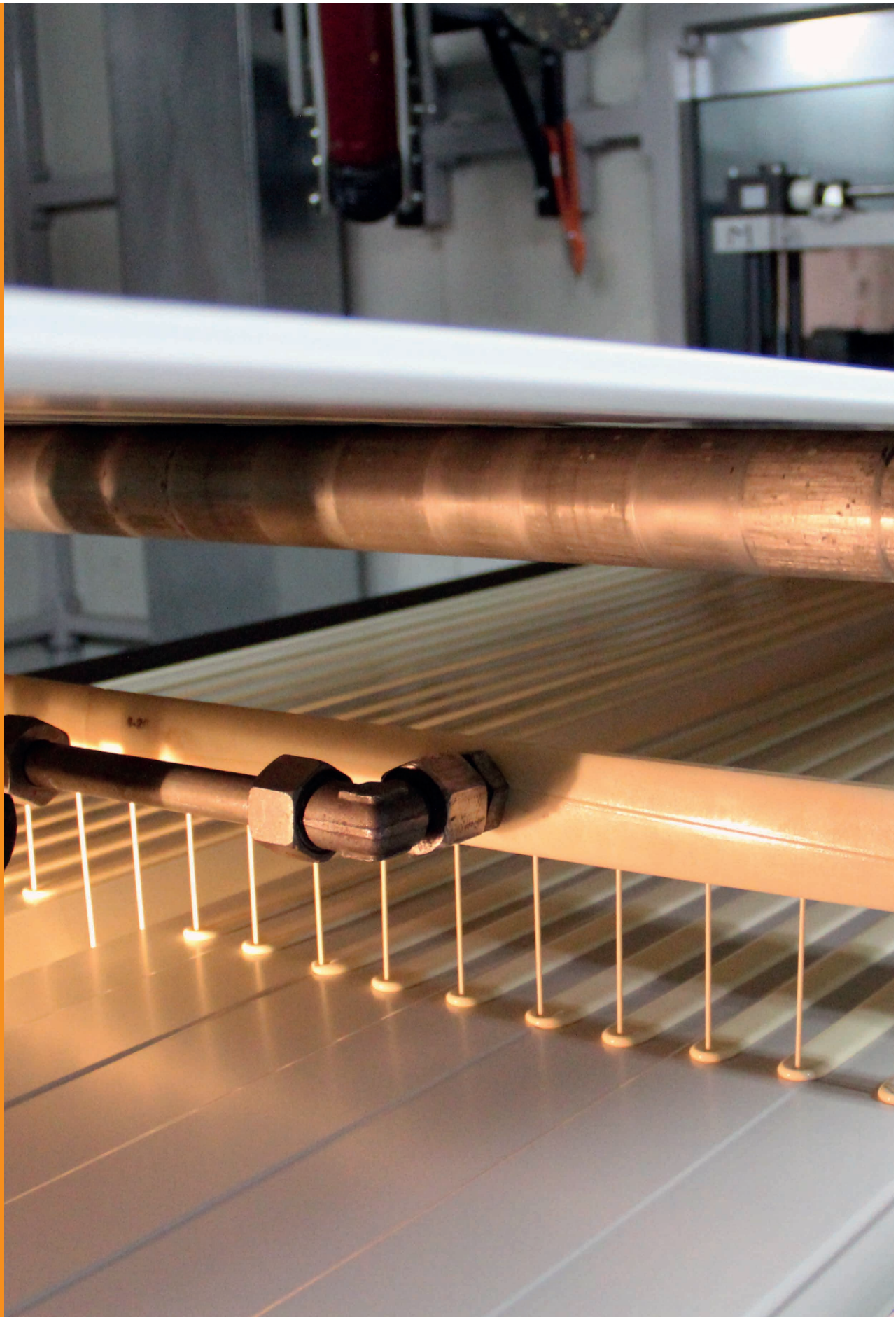
All our panels offer the highest technical specifications that meet the most demanding standards, without sacrificing the aesthetic demands and creative freedom of the project. This allows us to provide an accurate response in technical, aesthetic and functional terms.

We have implemented the most stringent controls in our production to ensure a high standard of quality, reflected in our ISO9001: 2015 certification, complemented by an exhaustive check of each production batch in our own laboratory.

MASTER PANEL

MASTER PANEL

PROPERTIES



What is Polyurethane?

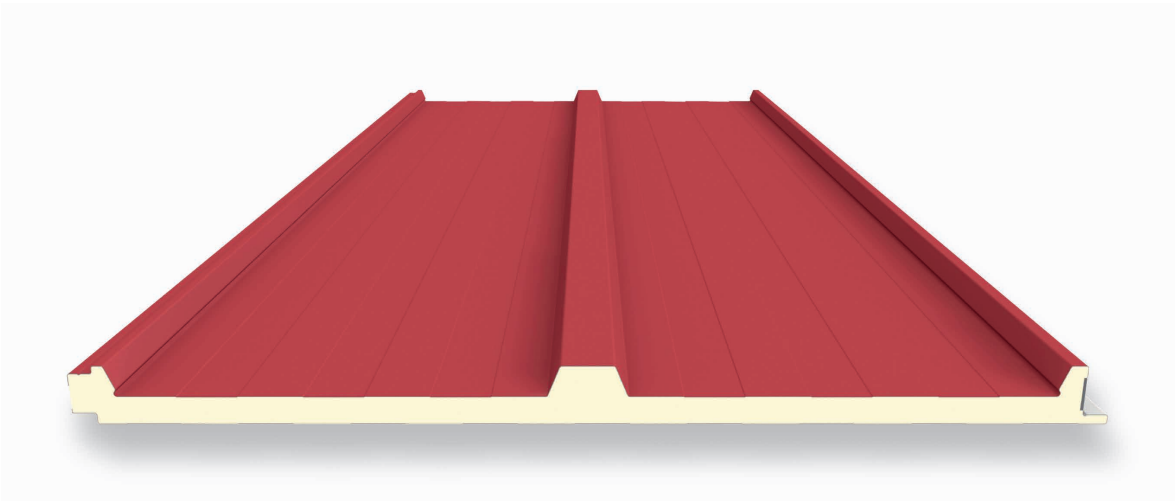
Polyurethane foam is a porous plastic material created by a condensation polymerization of two main components, a polyol and an isocyanate, to which pentane is added as a foaming agent. The mixing of the polyol and the isocyanate causes an exothermic reaction, in which the heat produced evaporates the pentane, a very low thermal conductivity gas that then forms bubbles.

The polyurethane in our panels has a closed cell structure that gives it the characteristics of good thermal stability, high compressive strength and excellent insulating properties. Polyurethane has a very low thermal conductivity, which makes it one of the most effective insulating materials in the world.

What are **Master** insulated metal panels?

Master insulated metal panels are created with a core of rigid polyurethane foam insulation bonded to two layers of metallic exterior covering, generally hot-dip galvanized steel, which are then prepainted in various qualities and finishes, depending on the needs of each project. During the manufacturing process, the insulating core expands, completely adhering to the covering layers without the use of any adhesive, so it may be considered that the combination forms a single product or construction element as far as its use and properties are concerned.

They are a unique solution for all types of building enclosures. Thanks to their mechanical and aesthetic properties they can serve a dual function, acting as both enclosure and cladding in a single system, achieving structural and insulation levels far superior to traditional products (blocks, wood, etc.), as well as being available in many finishes and colours to suit the aesthetics of every kind of project.

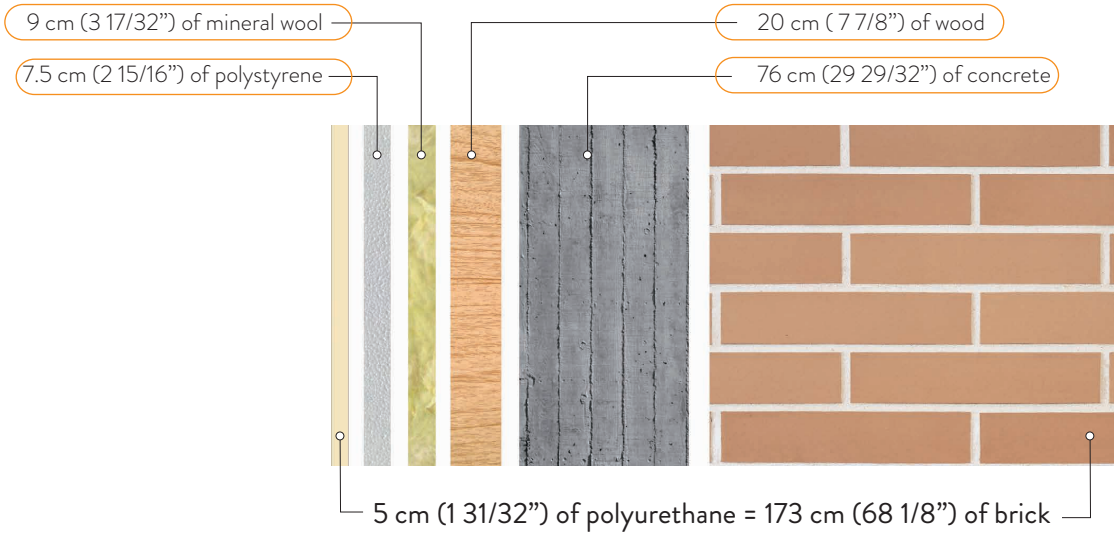


Thermal insulation

In construction, the thermal performance of the wall panel, roof or floor is expressed as its "U" value, which is basically the amount of heat that can pass through the wall, roof or floor. The insulating core of **Master** panels has the lowest coefficient of thermal conductivity available.

The use of **Master** panels makes it easier to keep buildings at a comfortable temperature throughout the year. They create a barrier that stops the flow of heat through the building walls, allowing a better control of the indoor temperature.

As you can see in the illustration below, insulating with Master panels achieves the same "U" value as other materials with considerably less thickness.



Mechanical properties

Master panels have high resistance to bending and twisting, the result of a perfect combination of the inherent rigidity of the outer layers and the excellent physical and mechanical properties of the foam. The different layers which make up the panels are bonded, forming a self-supporting product, giving rise to the so-called "sandwich effect".

Design of metal faces:
tensile/compressive stress resistant

+

Polyurethane interior:
It supports the shear stress

=

With a single material:
mechanical properties similar to other structural elements

Durability

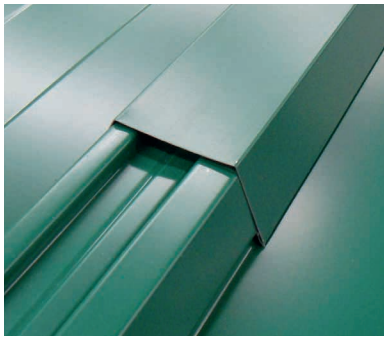
There is data to show that polyurethane insulated metal panels have proved themselves in construction over the past 40 years. Thanks to the excellent chemical and biological resistance of polyurethane, its high stability even in special conditions (extreme temperatures, high humidity) and the wide range of steel coatings to suit any environmental condition, polyurethane panels may offer the best guarantee of durability.

Watertightness

Master insulated metal panels, due to their system of design and assembly, make their buildings windproof and watertight. Additionally, the closed cell structure of the rigid polyurethane foam prevents the penetration of water and moisture which could affect the foam insulating properties and durability. This closed cell structure also prevents the panel from being attacked by microorganisms, making it ideal for the food industry.

According to **ASTM E 2140**, Standard test method which measures water penetration of metal roofing panel systems by static water pressure head, **Master-C** panels are classified as watertight by sealing and maintaining a column of 6" of water for 6 hours.

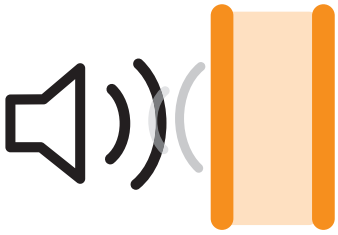
According to **ASTM E 331**, Standard test method for water penetration of exterior windows, skylights, doors and curtain walls by uniform static air pressure difference, **Master-F** panels are classified as watertight with a pressure difference of 12 PSF.



Acoustic insulation

In terms of acoustic insulation, with an acoustic frequency value of 125 - 750HZ, a medium-thick polyurethane insulated metal panels can reach an acoustic reduction index of 25-35 dB and a weighted sound absorption coefficient of 0,1.

By complementing it with other products, the panel can reach higher insulation values



Sustainability

Insulation is one of the cheapest and easiest ways to improve the energy efficiency of a building, whether old or new. Greater energy efficiency means that less energy is required to heat or cool buildings. In turn, this results in lower fuel consumption and lower emissions of environmentally harmful carbon dioxide. In addition, the waste from the panel can be used, since the steel sheets can be recycled and the rigid polyurethane foam can be incinerated, which allows the energy generated to be harnessed. During their life cycle, Master panels save 100 times the energy used in their production.

To reduce environmental impact, **Master** panels offer:

Excellent energy efficiency: saving energy and reducing CO2 emissions

The panels save 100 times the energy used in their production.

Minimum thickness: reducing the building's footprint and land use.

A reduction in structural size: lower environmental impact of the building structure.

Transport: being very light and thin, the insulation requires less transportation for delivery, resulting in low environmental impact.

No greenhouse gases: our Processes and Products are CFC and HCFC free.

Our waste: 95% of our waste is recyclable.

Recycling insulated metal panels:

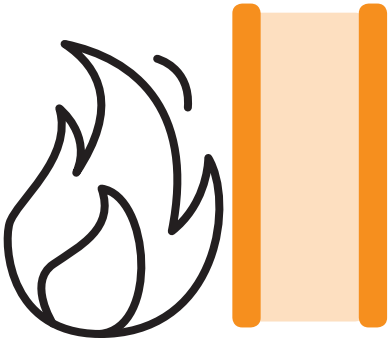
The metal cover of injected polyurethane insulated metal panels can be recycled following standard procedures for this type of material.

The insulating core of the panel is not affected by any European directives on dangerous products. Three recycling techniques can be used. The choice of one or another depends on the characteristics of the polyurethane foam used in the core of the panel, the after use and the cost:

- **Mechanical Recycling.** Using processes of crushing, granulating, grinding or pulverisation, particles of recyclable material are obtained that will be used for new polyurethane products.
- **Chemical Recycling.** This is based on the application of various chemical and thermal processes which decompose the foam into low molecular weight fractions. These are used to regenerate the diisocyanate which, together with the polyol, allows the production of new pieces of polyurethane.
- **Energy assessment.** Energy recovery through incineration. This technique obtains thermal and/or electrical energy from panel core waste. Current incineration technology ensures that emissions are controlled, thus minimizing their potential environmental impact.

PROPERTIES

Reaction to fire



In the last decade, polyurethane foams have evolved into construction elements with an excellent reaction to fire. In this context we should emphasize the polyisocyanurate foams (PIR), which are modified polyurethane foams whose molecules, unlike the linear chains of other polyurethanes (PUR), have a network structure that gives them fire-resistant properties. These foams have resulted in a new generation of panels called **Master-PIR**.

These panels are mainly characterized by their reaction to fire, and may be called self-extinguishing, which greatly reduces fire propagation and consequent smoke emissions. The polyurethane does not melt or drip when heated, and can help a building to resist the spread of fire. **Master-PIR** panels exceed fire safety standards and insurance requirements for a wide range of applications.

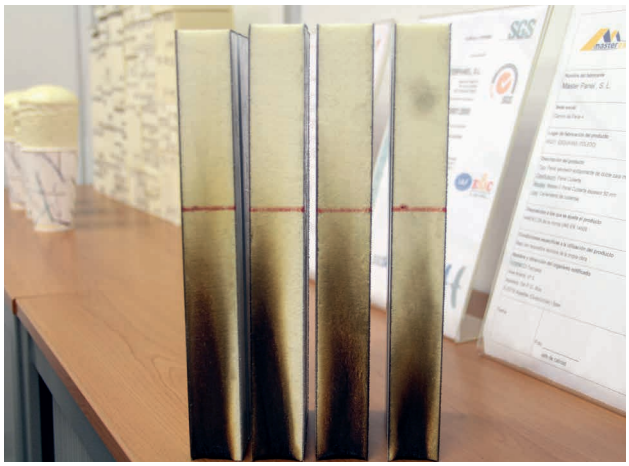
European legislation classifies the reaction to fire of construction products according to UNE- EN 13501 standard: Euroclass, which measures combustibility, quantity and opacity of smoke and inflamed particle fall. **Master-PIR** panels get the best fire reaction rating for polyurethane and polyisocyanurate foams, which is B-s1,d0.

In order to confirm the excellent fire reaction properties of Master-PIR panel foam, Masterpanel has tested **Master-PIR** foam according to ASTM E-84: Standard Test Method for Surface Burning Characteristics of Building Materials, by measuring flame propagation and smoke production. The results of these tests confirm the excellent fire reaction rating of **Master-PIR** panel foam by obtaining the best classification, i.e. Class A.

MASTER - PIR REACTION TO FIRE CLASSIFICATION

Flammability:	Smoke production	Burning droplets
B	S 1	d 0

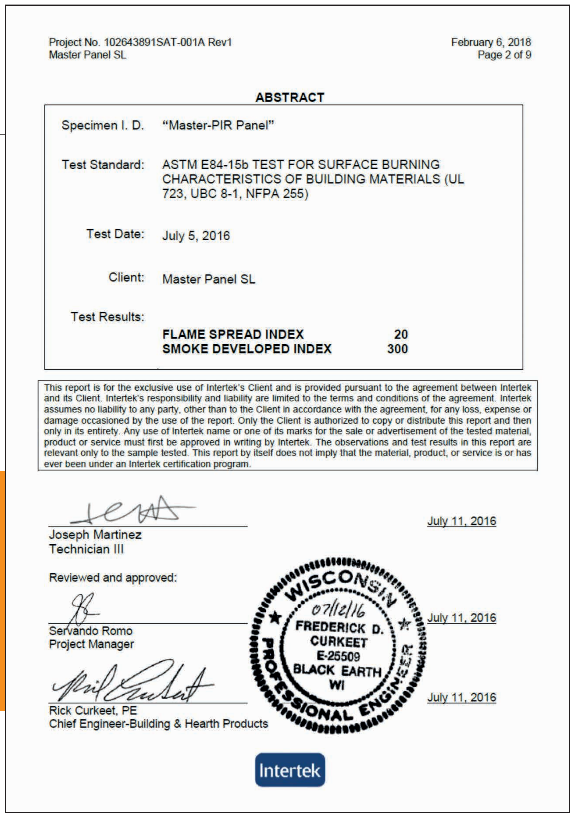
Reaction to fire **B-S1, d0**



intertek

Classification Report
n° 102643891SAT-001A REV1

ASTM E84
Flame spread index: 20
Smoke developed index: 300
Class A



Project No. 102643891SAT-001A Rev1
Master Panel SL

February 6, 2018
Page 2 of 9

ABSTRACT

Specimen I. D.	"Master-PIR Panel"
Test Standard:	ASTM E84-15b TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS (UL 723, UBC 8-1, NFPA 255)
Test Date:	July 5, 2016
Client:	Master Panel SL
Test Results:	**FLAME SPREAD INDEX 20** **SMOKE DEVELOPED INDEX 300**

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Joseph Martinez
Technician III
July 11, 2016

Reviewed and approved:

Servando Romo
Project Manager
July 11, 2016

Rick Curkeet, PE
Chief Engineer-Building & Hearth Products
July 11, 2016

WISCONSIN
07/12/16
FREDERICK D. CURKEET
E-25509
BLACK EARTH
WI
PROFESSIONAL ENGINEER

Intertek

UNE-EN 13501

COMBUSTIBILITY

A1	No contribution to fire
A2	No contribution to fire
B	**Very limited contribution to fire**
C	Limited contribution to fire
D	Moderate contribution to fire
E	High contribution to fire
F	Unclassified, with undetermined performance

SMOKE OPACITY: Amount and speed of emission

s1	**Low**
s2	Medium
s3	High

FALL OF BURNING PARTICLES

d0	**No fall in 600 sec**
d1	No fall in more than 10 sec
d2	No d0, no d1

AFITI LICOF

Classification Report n° C3066T16

Classification obtained in the laboratories of the Association for the promotion of research and technology of security against fires (AFITI), experts in the study of fire performance of multiple products used in construction.

MINISTERIO DE INDUSTRIA, ENERGÍA Y TURISMO

LICOF. Laboratorio Oficial de Ensayos
R.D. 1614/1985 de 1 de agosto
O.M. de 21 de mayo de 1991

AFITI LICOF Centro de Ensayos e Investigación del Fuego
Asociación para el Fomento de la Investigación y la Tecnología de la Seguridad contra Incendios

Certificado de ensayo
Nº: C3066T16

Solicitante	MASTERPANEL, S.L. Camino de Toledo, s/n 45221 – ESQUIVIAS (Toledo)
Tipo de muestra	Panel sándwich metálico con alma de PIR Fabricante: Masterpanel, S.L. Referencia: "MASTER PIR"
Ensayo/s	- Ensayo según norma UNE-EN 13823:2012, *"Ensayos de reacción al fuego de productos de construcción- Productos de construcción excluyendo revestimientos de suelos expuestos al ataque térmico provocado por un único objeto ardiendo"* - Ensayo según norma UNE-EN ISO 11925-2:2011 *"Ensayos de Reacción al Fuego de los materiales de construcción. Inflamabilidad de los productos de construcción cuando se someten a la acción directa de la llama. Parte 2: Ensayo con una fuente de llama única (ISO 11925-2)"*.
Fecha Ensayo/s	22-Jul-16
Certificado de los informes	Informe de ensayo n° 3066T16 (emitido por AFITI-LICOF en fecha 14-sep-16). Informe técnico EXAP nº EXAP-3066T16 (emitido por AFITI-LICOF en fecha 14-sep-16). Informe de clasificación n° 3066T16-2 (emitido por AFITI-LICOF en fecha 14-sep-16).

Clasificación de la Reacción al Fuego B-s1,d0

Clasificación según la norma UNE-EN 13501-1:2007+A1:2010 *"Clasificación en función del comportamiento frente al Fuego de productos de construcción y elementos parar edificación. Parte 1: Clasificación a partir de datos obtenidos en ensayos de Reacción al Fuego."*

Toledo, 14 de septiembre de 2016

Documento Firmado Digitalmente

Fdo: David Sáez García
Director Técnico del Laboratorio
de Reacción al Fuego

Los resultados incluidos en este Certificado hacen referencia única y exclusivamente a las muestras ensayadas, y no al producto en general.
En los informes indicados se incluyen aspectos importantes sobre la ejecución y desarrollo del ensayo que ha permitido la obtención de dicha clasificación de la Reacción al Fuego. Este certificado deberá utilizarse conjuntamente con los informes referenciado
La anulación o modificación de dichos informes implica la anulación o modificación del presente certificado.

SEDE SOCIAL Y LABORATORIOS
SEDE CENTRAL Y LABORATORIOS
+34 902 112 942
+34 901 706 587
licof@afiti.com
www.afiti.com

Quality

At **Masterpanel** we have implemented the most rigorous controls in our production process to guarantee our clients a high standard of quality, endorsed by a ISO9001:2015 certification, and supplemented by an exhaustive verification carried out on each production batch in our own laboratory.

TÜVNORD
TÜV NORD CERT GmbH
ISO 9001
tuev-nord.de

TÜVNORD

Certificate

ISO 9001

Management system as per
ISO 9001:2015

The Certification Body TÜV NORD CERT GmbH hereby confirms as a result of the audit, assessment and certification decision according to ISO/IEC 17021-1:2015, that the organization

Master Panel S.L.
Camino de Toledo s/n, Pol. Ind. La Cárdena
45221 Esquivias (Toledo)
Spain

MASTER PANEL

operates a management system in accordance with the requirements of ISO 9001:2015 and will be assessed for conformity within the 3 year term of validity of the certificate.

Scope

Continuous Production of Polyurethane / Polyisocyanurate Insulated Metal Panels.

Certificate Registration No. 44 100 245010044 Valid from 19.04.2024
Audit Report No. 240088 Valid until 04.06.2026

Madrid, 19.04.2024

Certification Body at TÜV NORD CERT GmbH

TÜV NORD CERT GmbH
Am TÜV 1, 45307 Essen
www.tuev-nord-cert.com

TÜV®

All our products are CE marked, which certifies that our panels comply with the current European legislation.

CE

CE
11
UNE-EN 14509

MASTER PANEL

C/Camino de Toledo s/n.
45221 Esquivias (Toledo)
España

Panel sándwich aislante autoportante de doble cara metálica

Uso previsto: ____
Referencia: ___

Características del núcleo:
Aislamiento: ___ Densidad: __ Kg/m³(±10%)
Espesor: __ mm

Características del revestimiento:
Tipo: Acero (EN 10169) Acabado: ___
Espesor cara exterior: __ mm Espesor cara interior: __ mm Masa __ Kg/m²

Propiedades térmicas:
Coeficiente de transmitancia térmica U ——> __ W/m²·K

Resistencias mecánicas:

Resistencia a tracción ——> __ MPa
Resistencia a compresión ——> __ MPa
Resistencia a esfuerzo cortante ——> __ MPa
Resistencia a esfuerzo cortante (Módulo) ——> __ MPa
Resistencia a esfuerzo cortante a largo plazo ——> __ MPa
Coeficiente de fluencia (t = 2000 h) ——> __ MPa
Coeficiente de fluencia (t = 100.000 h) ——> __ MPa
Resistencia a flexión en un vano
- Flexión a presión ——> __ MPa
- Flexión a presión a temperatura elevada——> __ MPa
- Flexión a succión ——> __ MPa
- Flexión a succión, a temperatura elevada ——> __ MPa

Resistencia a flexión en un apoyo intermedio
- Flexión a presión ——> __ MPa
- Flexión a presión a temperatura elevada ——> __ MPa
- Flexión a succión ——> __ MPa
- Flexión a succión, a temperatura elevada ——> __ MPa

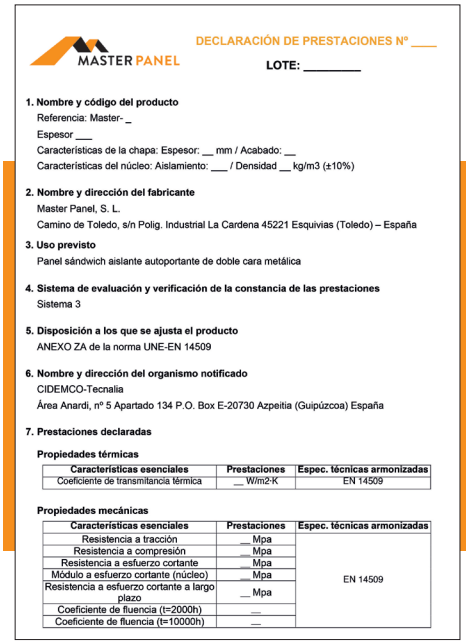
Resistencias mecánicas:

Tensión de arrugamiento (cara exterior)
- En vano ——> __ MPa
- En vano, a temperatura elevada ——> __ MPa
- En el apoyo central ——> __ MPa
- En el apoyo central, a temperatura elevada ——> __ MPa

Tensión de arrugamiento (cara interior)
- En vano ——> __ MPa
- En el apoyo central ——> __ MPa

Comportamiento ante el fuego:
Reacción al fuego ——> ___
Resistencia al fuego ——> ___

Otras propiedades:
Permeabilidad al agua ——> ___
Permeabilidad al aire ——> ___
Permeabilidad al vapor de agua ——> ___
Aislamiento al ruido aéreo——> ___
Absorción acústica ——> ___
Durabilidad: ___



MASTER PANEL

DECLARACIÓN DE PRESTACIONES Nº ____

LOTE: _____

1. Nombre y código del producto
Referencia: Master- _
Espesor ___
Características de la chapa: Espesor: __ mm / Acabado: __
Características del núcleo: Aislamiento: ___ / Densidad __ kg/m3 (±10%)

2. Nombre y dirección del fabricante
Master Panel, S. L.
Camino de Toledo, s/n Polig. Industrial La Cardena 45221 Esquivias (Toledo) – España

3. Uso previsto
Panel sándwich aislante autoportante de doble cara metálica

4. Sistema de evaluación y verificación de la constancia de las prestaciones
Sistema 3

5. Disposición a los que se ajusta el producto
ANEXO ZA de la norma UNE-EN 14509

6. Nombre y dirección del organismo notificado
CIDEMCO-Tecnalia
Área Anardi, nº 5 Apartado 134 P.O. Box E-20730 Azpeitia (Guipúzcoa) España

7. Prestaciones declaradas

Propiedades térmicas

Características esenciales	Prestaciones	Espec. técnicas armonizadas
Coeficiente de transmitancia térmica	__ W/m2·K	EN 14509

Propiedades mecánicas

Características esenciales	Prestaciones	Espec. técnicas armonizadas
Resistencia a tracción	__ Mpa	EN 14509
Resistencia a compresión	__ Mpa	
Resistencia a esfuerzo cortante	__ Mpa	
Módulo a esfuerzo cortante (núcleo)	__ Mpa	
Resistencia a esfuerzo cortante a largo plazo	__ Mpa	
Coeficiente de fluencia (t=2000h)	__	
Coeficiente de fluencia (t=10000h)	__	

Resistencia a flexión en un vano		
Flexión a presión	__ Mpa	EN 14509
Flexión a presión a temperatura elevada	__ Mpa	
Flexión a succión	__ Mpa	
Flexión a succión a temperatura elevada	__ Mpa	
Resistencia a flexión en un apoyo intermedio		
Flexión a presión	__ Mpa	EN 14509
Flexión a presión a temperatura elevada	__ Mpa	
Flexión a succión	__ Mpa	
Flexión a succión a temperatura elevada	__ Mpa	
Tensión de arrugamiento (cara exterior)		
En vano	__ Mpa	EN 14509
En vano a temperatura elevada	__ Mpa	
En el apoyo central	__ Mpa	
En el apoyo central a temperatura elevada	__ Mpa	
Tensión de arrugamiento (cara interior)		
En vano	__ Mpa	EN 14509
En vano a temperatura elevada	__ Mpa	

Comportamiento al fuego

Características esenciales	Prestaciones	Espec. técnicas armonizadas
Reacción al fuego	__	EN 13501
Resistencia al fuego	__	EN 13501

Otras propiedades

Características esenciales	Prestaciones	Espec. técnicas armonizadas
Permeabilidad al agua	__	EN 14509
Permeabilidad al aire	__	
Permeabilidad al vapor de agua	__	
Absorción acústica	__	
Durabilidad	__	

Las prestaciones del producto identificado en el punto 1 son conformes con las prestaciones declaradas en el punto 7.

La presente declaración de prestaciones se emite bajo la sola responsabilidad del fabricante identificado en el punto 2

masterpanel
C.I.F.: B-A5603867
Telf.: 925 51 99 26

Responsable de Calidad 01-01-2017

DIMENSIONAL TOLERANCE TABLE

DIMENSION	MAXIMUM TOLERANCE
Panel thickness	E ≤ 100 mm (3 15/16") ± 2 mm (3/32")
	E ≥ 100 mm (3 15/16") ± 2 %
Deviation from flatness	Deviation from flatness 1.5 mm (1/16")
Panel length	L ≤ 3 m (9´ 10 1/8") ± 5 mm (13/64")
	L > 3 m (9´10 1/8") ± 10 mm (13/32")
Panel Coverage	± 2 mm (3/32")
Non-squareness	6 mm (1/4")
Deviation from straightness	1 mm (1/32") per meter, maximum 5 mm (13/64")
Warping	2 mm (3/32") per meter in length, maximum 10 mm (13/32")
	10 mm (13/32") in panel width
Profiling design	± 3 mm (1/8")

APPLICABLE REGULATIONS

EN 14509	Self-supporting double skin metal faced insulating panels.
EN 10143	Continuous hot-dip metal coated steel sheets and strips.
EN 10169	Continuously organic coated (coil coated) steel flat products.
EN 10346	Continuously hot-dip coated steel flat products.
EN 13501	Classification based on fire resistance of construction products and building elements.

A Master Panel for every requirement

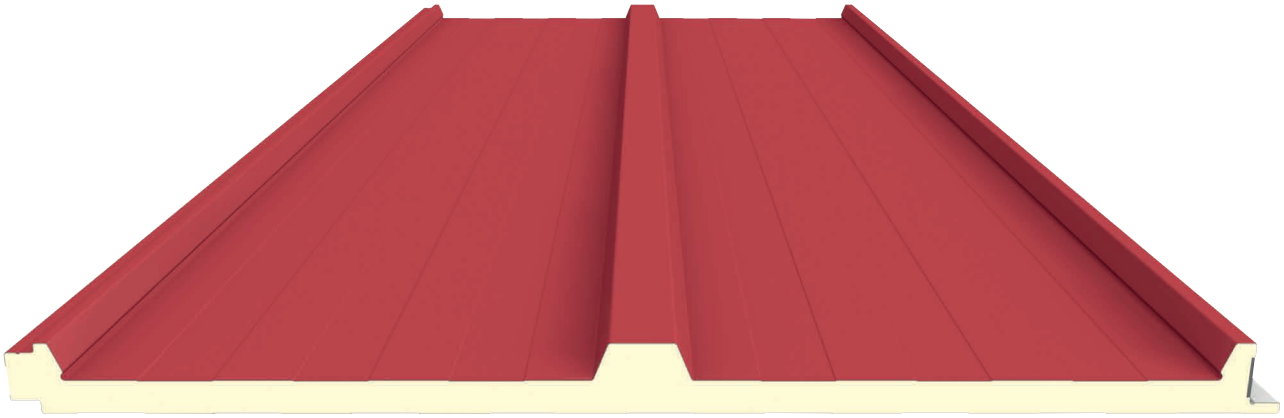
MASTER PANEL

Master-C roofing panels

MASTER-C panels are structural roof panels composed of steel skins laminated to a minimum 1.6 inch polyisocyanurate foam core (min 2.3 pcf density).

MASTER-C panels are specially designed for use in al types of roofs, both for industrial construction and for modular or commercial buildings.

Installation is very simple, and provides total watertightness (roof slopes of over 1/2 :12).

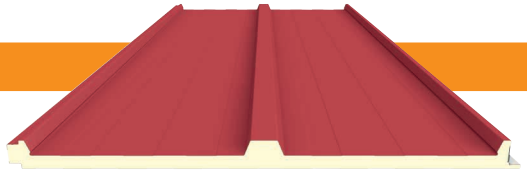


MASTER-C panels have a tongue and groove jointing system with a steel cover cap that hides and protects the fasteners and ensures the watertightness of the system.

External profile of the panel is a three-rib design, available in seven different thicknesses, with two different interior rib designs and a wide range of colours to meet customer needs.

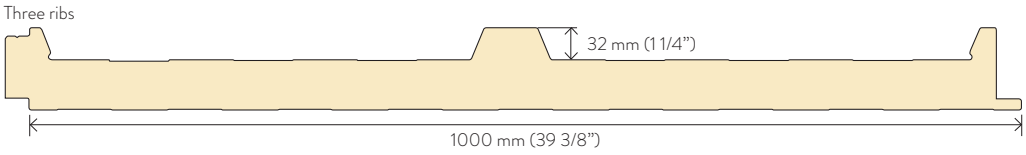
Master-C roofing panels

TECHNICAL SPECIFICATIONS

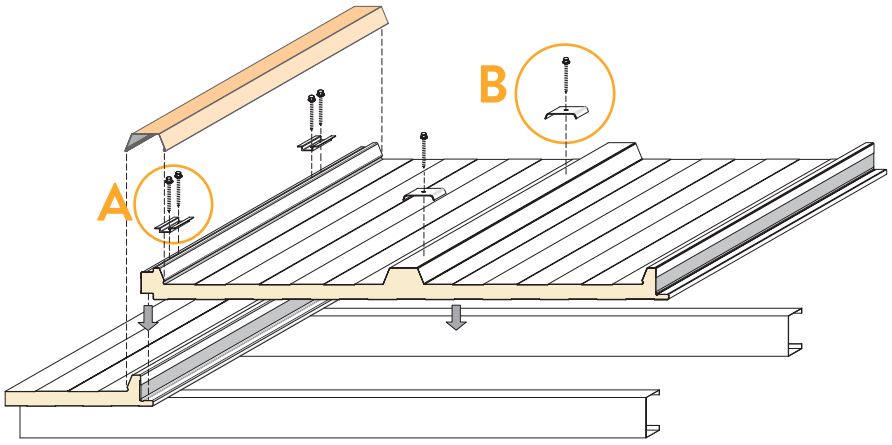


Three ribs

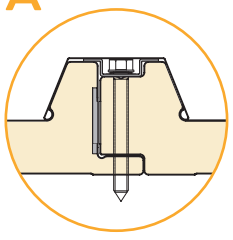
	Values
Panel thickness	40, 50, 60, 80, 100, 120 mm. 1 9/16, 1 31/32, 2 3/8, 3 5/32, 3 15/16, 4 23/32 inch.
Cover Width	1000 mm. (39 3/8")
Length	Up to 11.900 mm. (39 ft.)
Field of application	Roofing
Outer face thickness	mm 0.5 / 0.6 / 0.7
Inner face thickness	GAUGE 26 / 24 / 22
Exterior face	G90 galvanized or AZ50 aluminium-zinc, coated steel in 26 GA and above
Interior face:	G90 galvanized or AZ50 aluminium-zinc, coated steel in 26 GA and above
Coatings (see section on Finishes)	Polyester 25 um (1 mil)
	PVDF 25um / 35um (1 mil / 1.38 mils)
	PU 55um (Granite® HDX/SDP 50) (2.16 mils)
	Imitation wood (inner face)
	PVC 120um (4.8mil) (foodsafe)
Outer ribbing	Three ribs
Inner ribbing	Standard / Flat
Core type	Polyisocyanurate (PIR)
Core Density	40 kg/m³ (+/- 10%) (2.3 PCF)



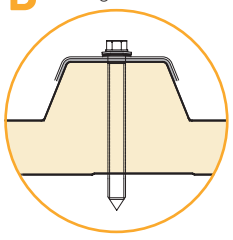
Joint detail.



A Seam Plate:



B Bearing Plate:



Panel Thickness		Panel weight	U-Value	R-Value
mm	inch	PSF	BTU/Hr ft² °F	Hr ft² °F/BTU
40	1 9/16	2.23	0.090	11.06
50	1 31/32	2.31	0.073	13.74
60	2 3/8	2.40	0.061	16.45
80	3 5/32	2.56	0.046	21.84
100	3 15/16	2.72	0.037	27.20
120	4 23/32	2.89	0.031	32.55

FUNCTIONS AND BENEFITS OF MASTER-C PANELS

- Efficient thermal insulation capacity
- High mechanical strength
- The fasteners are hidden and protected
- Exceptional dimensional stability
- Watertight against water vapor
- Resistant to aggressive environments
- A versatile material that allows any configuration
- Quick to install and easy to maintain (easy to clean)
- Easily removable and can be reused
- Made-to measure, avoids waste
- Made with recyclable materials

REACTION TO FIRE

intertek

ASTM E84 (MASTER-PIR) Class A
Flame Spread Index: **20**
Smoke developed index: **300**

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Nº 3406T18

B-s1 d0
Nº 3066T16

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Testing and approvals:

Master Panel roofing panels meet the most demanding requirements. We have large experience in producing insulated metal panels in our continuous production line and we have obtained the #FLapproval with reference #FL21699.

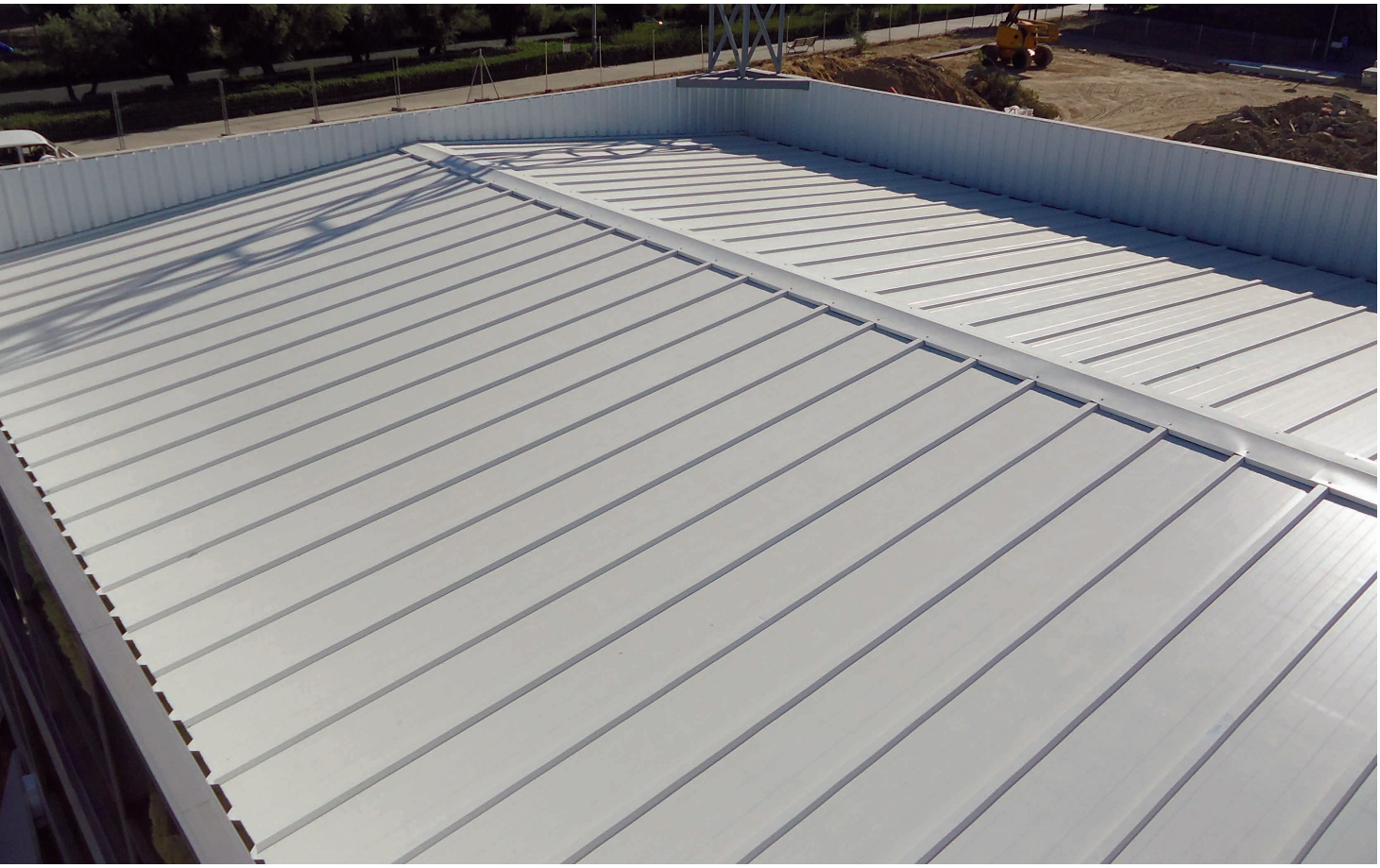
TEST	TEST METHOD	RESULTS
Fire	ASTM E 84	Flame spread index 20 Smoke developed index 300
Permeability	ASTM E 2140	No water leaks while maintaining continuously 6" head of water for 6 h
Strength	ASTM E 8	> 32 ksi steel
Wind Uplift	ASTM E 1592 FM4471	FM Windstorm Classification 1-270: Min 1.6" panel installed at 1 ft span on min. 16 ga purlins FM Windstorm Classification 1-75: Min 1.6" panel installed at 4 ft span on min. 16 ga purlins

Allowable Inward and Outward Loads (psf). Minimum 2.44" thick 26-26 ga., Three Rib Profile

Panel Span (ft)	Span Condition		
	Single Span	Two Span	3 or more Spans
1	121.8	131.9	137.5
1.5	81.2	88.4	99.7
2	60.9	66.6	74.8
2.5	48.7	53.5	59.9
3	40.6	44.7	49.9
3.5	34.8	38.4	42.8
4	30.5	33.6	37.5

NOTES:
1. Allowable inward and outward loads are based on panel an connection strength and deflection limit of L/240.
2. Allowable loads are obtained from ASTM E1592 test an calculated with a factor of safety 2.0 for connection.
3. Panels will be fastened along each panel seam with (2) #12-24 × 4-1/4" HWH fasteners with 1/2" bonded sealing washer installed through 2-3/8" X 1-9/16" × 16 ga. bearing plate prior to installing the 24 ga. steel cap.
4. (1) #12-24 × 4-1/4" HWH fastener with 1/2" bonded sealing washer will be installed through 1-9/16" × 20 ga. bearing plate with sealing rubber along the intermediate rib of each panel at each purling.
5. #12-24 × 1" HWH fasteners with 1/2" bonded sealing washers will be installed staggered 2.5 -ft o.c on either side of the seam cap.
6. The structural capacity of the panel supports are not considered and must be examined independently.

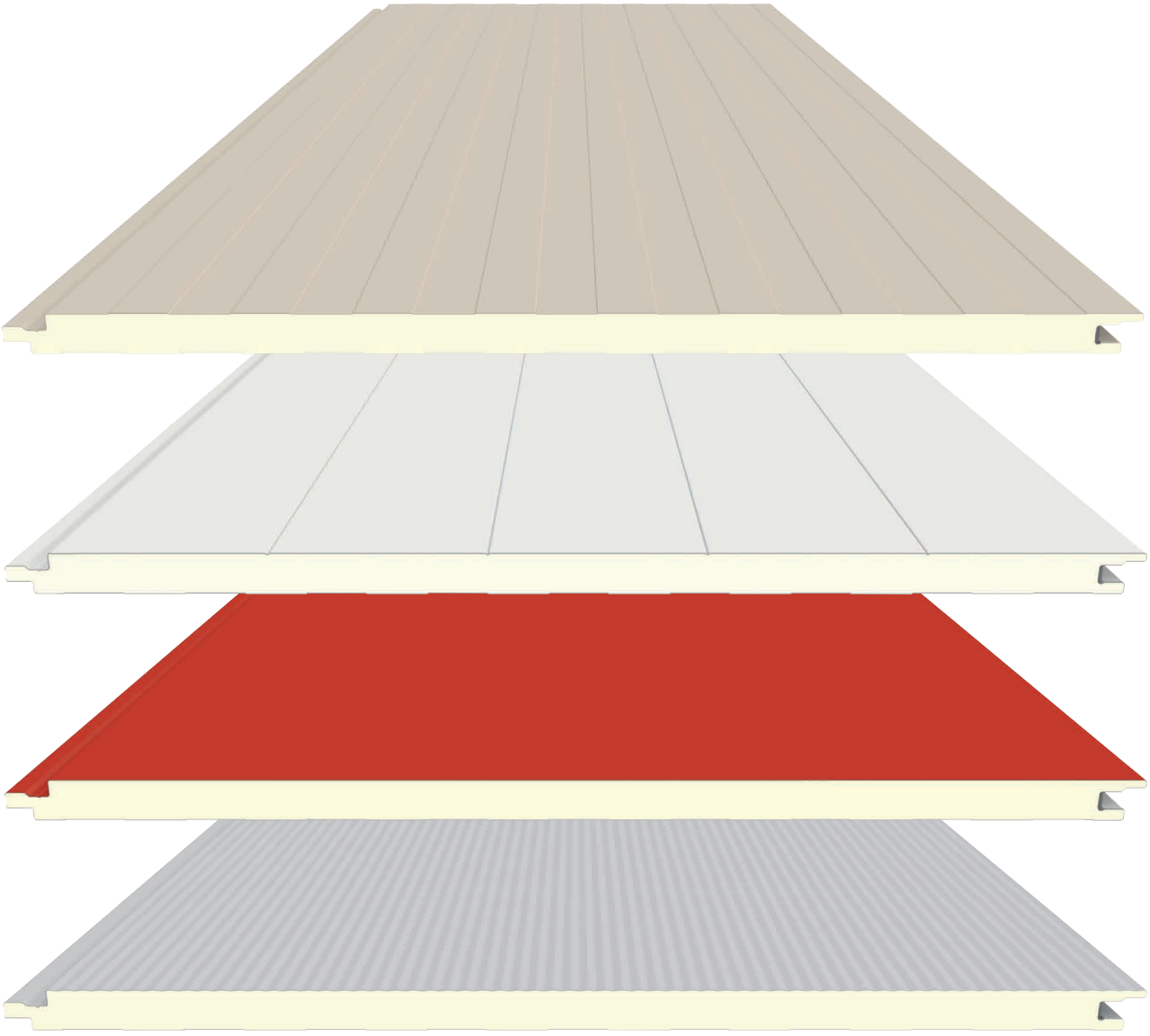
Master-C roofing panels



Master-F wall panels

MASTER-F panels are structural wall Insulated Metal Panels composed of steel skins laminated to a minimum of 1.96-inch polyisocyanurate foam core (min 2.3 pcf density)..

MASTER-F panels have a tongue and groove joining system designed to hide and protect the fixings, which gives an excellent aesthetic appearance. They can be installed in both vertical and horizontal positions.



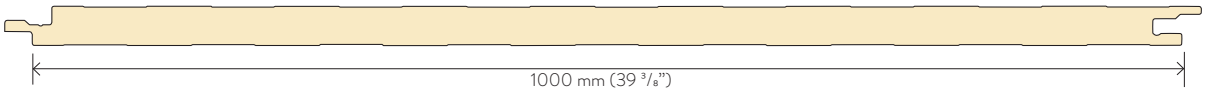
They come in four different exterior finishes (standard, lined, flat, micro-rib) and two different inner ribbings (standard and flat), as well as a wide range of available colors.

Master-F wall panels

TECHNICAL SPECIFICATIONS

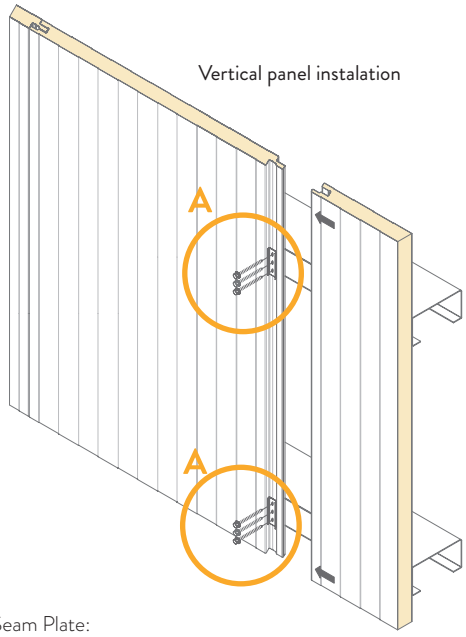
Standard | Lined | Flat | Micro-rib

	Values
Panel thickness	50, 60, 80, 100 mm. 1 31/32, 2 3/8, 3 5/32, 3 15/16, inch.
Cover Width	1000 mm. (39 3/8")
Length	Up to 11.900 mm. (39 ft.)
Field of application	Wall panels
Outer face thickness	mm 0.5 / 0.6 / 0.7
Inner face thickness	GAUGE 26 / 24 / 22
Exterior face	G90 galvanized or AZ50 aluminium-zinc, coated steel in 26 GA and above
Interior face:	G90 galvanized or AZ50 aluminium-zinc, coated steel in 26 GA and above
Coatings (see section on Finishes)	Polyester 25 um (1 mil)
	PVDF 25um / 35um (1 mil / 1.38 mils)
	PU 55um (Granite® HDX/SDP 50) (2.16 mils)
	PVC 120um (4.8mil) (foodsafe)
Outer ribbing	Standard / Lined / Flat / Micro-rib
Inner ribbing	Standard / Flat
Core type	Polyisocyanurate (PIR)
Core Density	40 kg/m³ (+/- 10%) (2.3 PCF)

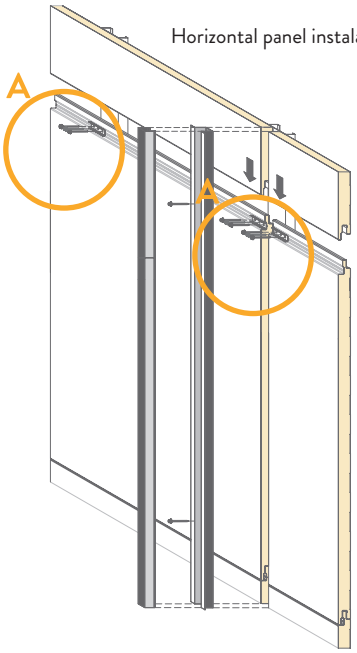


Joint detail.

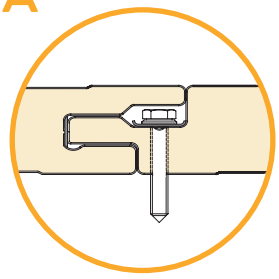
Vertical panel instalation



Horizontal panel instalation



A Seam Plate:



Panel Thickness		Panel weight	U-Value	R-Value
mm	inch	PSF	BTU/Hr ft² °F	Hr ft² °F/BTU
50	1 31/32	2.17	0.075	13.28
60	2 3/8	2.25	0.062	16.17
80	3 5/32	2.41	0.046	21.59
100	3 15/16	2.58	0.037	26.99

FUNCTIONS AND BENEFITS OF **MASTER-F** PANELS

- Aesthetically appealing
- Efficient thermal insulation capacity
- High mechanical strength
- Exceptional dimensional stability
- Watertight against water vapor
- Resistant to aggressive environments
- A versatile material that allows any configuration
- Quick to install and easy to maintain (easy to clean)
- Easily removable and can be reused
- Made-to-measure, avoids waste
- Made with recyclable materials

REACTION TO FIRE

intertek

ASTM E84 (MASTER-PIR) Class A
Flame Spread Index: **20**
Smoke developed index: **300**

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Testing and approvals:

Master Panel wall panel meet the most demanding requirements. We have large experience in producing insulated metal panels in our continuous production line and we have obtained the FL approval with reference #FL27199

TEST	TEST METHOD	RESULTS
Fire	ASTM E 84	Flame spread index 20 Smoke developed index 300
Strength	ASTM E 8	> 32 ksi steel
Wind Uplift	ASTM E 330	Design load up to 67.5 psf
Water penetration	ASTM E 331	No water leakage at 12 psf
Permeability	ASTM E 283	< 0.004 cfm/ft^2 at 12 psf

Master-F Wall Panel

Panel Description	Support Spacing (in)	Allowable Inward Load (psf) FD1 & FD 2	Alowable Outward Load (psf) FD1	FD2
Master F Min. 26 ga. Exterior & Interior Skins Panel Core Thickness: 1-31/32", 2-3/8", 3-5/32" 3-15/16", 4-23/32", 5-15/16" (50, 60, 80, 100, 120 & 150 mm)	36	132.5	**34.5**	**67.5**
	39	122.3	33.7	65.4
	42	113.6	32.8	63.3
	48	99.4	31.2	56.3
	54	88.3	29.5	50.0
	60	79.5	27.8	45.0
	66	72.3	26.2	40.9
	72	66.3	24.4	37.5
	78	61.2	22.5	34.6
	84	56.8	20.9	32.1
	90	**53.0**	**19.5**	**30.0**

Notes:
1. Allowable load is the lowest value of panel strength, connection strength & deflection limit of L/180
2. Allowable load is aplicable to two or more span conditions.
3. The bold numbers indicate design loads obtained from test reports.
4. Panels must be installed as per Evaluation Report FL27199.1 and Master Panel current installation procedure.
5. For Fastening Design FD1, U-clips are fastened to min. 14 ga. steel with (2) 1/4"-14 Type 3 SDS or to min. 16 ga. steel with (3) 1/4'-14 Type 3 SDS at all supports.
6. The Fastening Design FD2 includes U-clip attachment plus 3 Fab-loks fasteners per panel width at supports. Fastener spacing is 9.8" (250 mm) o.c. from female edge of panel seam.
7. Continuous bead of Dow Corning® 791 silicone weatherproofing sealant was field applied along the panel seams.
8. The structural capacity of support beam are not considered and must be examined independently by others.
9. Minimum bearing width of support is 2.5"

Master-F wall panels


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3D
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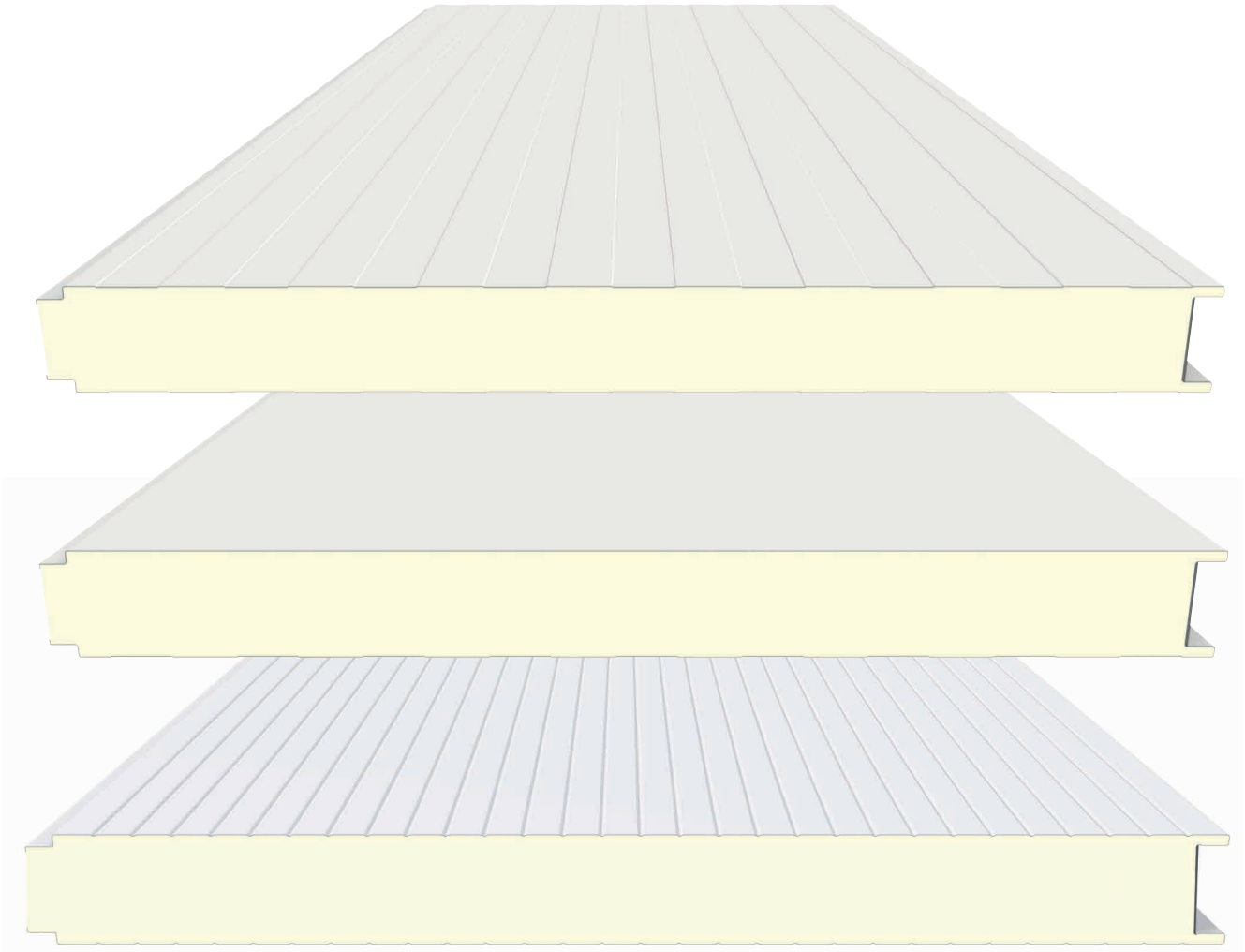
Master-Frigo cold-room panels

MASTER-FRIGO panels are continuous production line prefabricated panels, and are composed panels are Insulated Metal Panels composed of steel skins laminated to a minimum of 1.6inch polyisocyanurate foam core (min 2.3 pcf density).

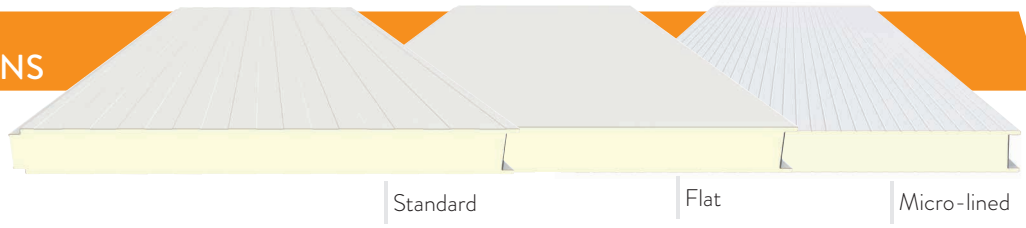
MASTER-FRIGO panels have a tongue and groove joining system are specially designed for use in all types of projects related to refrigeration industry, like the agro-food industry for refrigerated transport and storage of frozen and deep-frozen food.



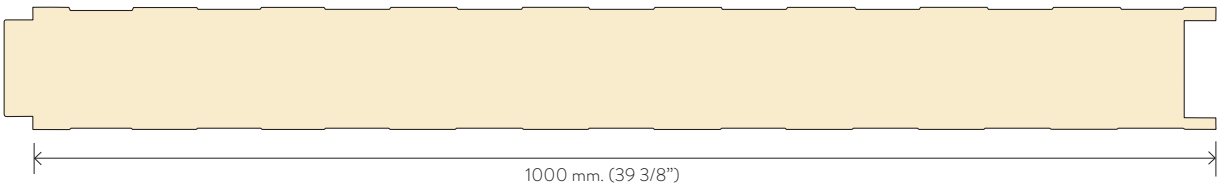
MASTER-FRIGO panels are available in seven different thicknesses. They come in three different exterior finishes (standard, flat and micro-lined) and three different interior finishes (standard, flat and micro-lined), as well as a wide range of available colours.

Master-Frigo cold-room panels

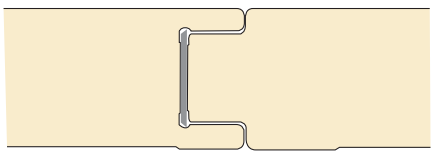
TECHNICAL SPECIFICATIONS

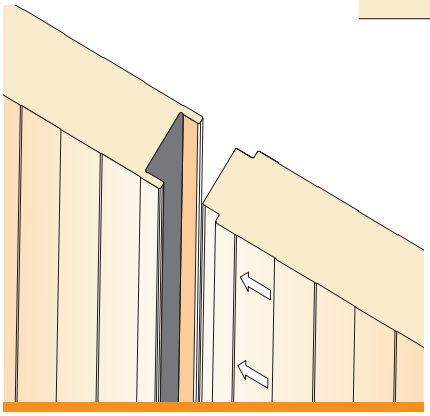


	Values
Panel thickness	40, 50, 60, 80, 100, 120, 150 mm. 1 9/16, 1 31/32, 2 3/8, 3 5/32, 3 15/16, 4 23/32, 6, inch.
Cover Width	1000 mm. (39 3/8")
Length	Up to 11.900 mm. (39 ft.)
Field of application	Cold room
Outer face thickness	mm 0.5 / 0.6 / 0.7
Inner face thickness	GAUGE 26 / 24 / 22
Exterior face	G90 galvanized or AZ50 aluminium-zinc, coated steel in 26 GA and above
Interior face:	G90 galvanized or AZ50 aluminium-zinc, coated steel in 26 GA and above
Coatings (see section on Finishes)	Polyester 25 um (1 mil)
	PVDF 25um / 35um (1 mil / 1.38 mils)
	PU 55um (Granite® HDX/SDP 50) (2.16 mils)
	Wood imitation (inner face)
	PVC 120um (4,8mil) (foodsafe)
Outer ribbing	Standard / Flat / Micro-lined
Inner ribbing	Standard / Flat / Micro-lined
Core type	Polyisocyanurate (PIR)
Core Density	40 kg/m³ (+/- 10%) (2.3 PCF)



Joint detail.





Panel Thickness		Panel weight	U-Value	R-Value
mm	inch	PSF	BTU/Hr ft² °F	Hr ft² °F/BTU
40	1 9/16	2.06	0.100	9.96
50	1 31/32	2.14	0.079	12.72
60	2 3/8	2.22	0.064	15.66
80	3 5/32	2.38	0.047	21.26
100	3 15/16	2.55	0.037	26.73
120	4 23/32	2.71	0.031	32.15
150	6	2.96	0.025	40.21

FUNCTIONS AND BENEFITS OF **MASTER-FRIGO** PANELS

- Aesthetically appealing
- Efficient thermal insulation capacity
- High mechanical strength
- Exceptional dimensional stability
- Watertight against water vapor
- Resistant to aggressive environments
- A versatile material that allows any configuration
- Quick to install and easy to maintain (easy to clean)
- Easily removable and can be reused
- Made-to-measure, avoids waste
- Made with recyclable materials

REACTION TO FIRE

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ASTM E84 (MASTER-PIR) Class A
Flame Spread Index: **20**
Smoke developed index: **300**

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Testing and approvals:

Master panel cold-room panels the most demanding requirements. We have large experience in producing insulated metal panels in our continuous production line.

TEST	TEST METHOD	RESULTS
Fire	ASTM E 84	Flame spread index 20 Smoke developed index 300
Strength	ASTM E 8	> 32 ksi steel

Master-Frigo cold-room panels

ASSEMBLY AND ERECTION OF COLD ROOMS

Basic assembly instructions:

- The ground on which the insulated metal panels are to be set up should be completely flat, clean and smooth.
- Once the panels are installed, the verticality (walls) and horizontality (ceilings and roofs) should be checked, and any deviations corrected.
- The system of vertical jointing between panels is effected by pressure on the tongue and groove joint, with the panels being brought flush to each other.
- The wall–ceiling junction should be carried out strictly following the instructions provided (see technical details on page 76), with special attention being paid to cuts that are made, when these may be necessary, to create the junction.
- When the joint between panels does not by itself have sufficient capacity to prevent the formation of condensation or ice, a sealant is applied in that area; this could be silicone (for air and water tightness), butyl (for water vapour tightness) or foam injected on site (to reduce the thermal bridge between the panels).
- The fixing of roof panels attached to building structures should be performed using connector rods or guy wires. The building structure must be designed to withstand both its usual loads and those due to the weight of the panels themselves.
- Refrigerating equipment and accessories must not be directly hung from the panels, but require a separate support system.
- Avoid the use of cutting discs, as these may produce metal shavings which can stick to the panel surfaces and cause oxidation problems. If cutting discs must be used, ensure the complete removal of all metal shavings.
- Check that appropriate screws for the required structure are used.
- Remove the protective plastic film from the panels.
- Ensure that any possible scratches that may occur on the outer face are correctly repaired.
- Check that individual points are properly sealed.

Table of minimum recommended thicknesses for insulation

Type of cold room	Range of temperature °C	Interior cold room			Exterior cold room		
		Floor	Wall	Ceiling	Floor	Wall	Ceiling
Cold store	+15 to +4 °C (+59 to +39 °F)	NO	60 mm (2 3/8")	60 mm (2 3/8")	NO	60 mm (2 3/8")	60 mm (2 3/8")
	+4 to -4 °C (+39 to +24 °F)	50 mm (1 31/32")	60 mm (2 3/8")	60 mm (2 3/8")	60 mm (2 3/8")	80 mm (3 5/32")	80 mm (3 5/32")
Freezer	-4 to -10 °C (+24 to +14 °F)	60 mm (2 3/8")	80 mm (3 5/32")	80 mm (3 5/32")	60 mm (2 3/8")	80 mm (3 5/32")	100 mm (3 15/16")
	-10 to -18 °C (+14 to 0 °F)	80 mm (3 5/32")	100 mm (3 15/16")	100 mm (3 15/16")	80 mm (3 5/32")	100 mm (3 15/16")	100 mm (3 15/16")
	-18 to -26 °C (0 to -15 °F)	100 mm (3 15/16")	100 mm (3 15/16")	100 mm (3 15/16")	100 mm (3 15/16")	120 mm (4 23/32")	120 mm (4 23/32")
	-26 to -40 °C (-15 to -40 °F)	100 mm (3 15/16")	120 mm (4 23/32")	120 mm (4 23/32")	120 mm (4 23/32")	150 mm (6")	150 mm (6")
Blast freezer	-40 to -46 °C (-40 to -50 °F)	120 mm (4 23/32")	150 mm (6")	150 mm (6")	120 mm (4 23/32")	150 mm (6")	150 mm (6")

MAINTENANCE GUIDELINES FOR COLD ROOM

- The condition and tension of the ceiling fastenings tensors must be checked as well as cleaned every six months.
- The panel surfaces can be washed with a mixture of tap water and a neutral agent, then rinsed with running water and dried.
- Check the water collection channels once a year, ensuring that they are clean and in good condition.
- Check the condition of the sealing elements once a year.

Master-Frigo cold-room panels


45
46
70
71
22
23

Master-Basic insulation boards

Insulating boards prefabricated in a continuous production line, composed of two sheets of paper (on request there is the possibility of other finishes different from paper) and joined together by a core of Polyisocyanurate (PIR) foam forming a sandwich type element.

TECHNICAL SPECIFICATIONS

	Values
Panel thickness	50, 80, 100 mm. 1 31/32, 3 5/32, 3 15/16, inch.
Cover Width	1200mm (3.94 ft)
Length	Standard 2285mm (7.50 ft) (other lengths on request)
Field of application	Insulation in floors, walls and false ceilings
Face composition	Multilayer kraft paper-aluminum complex
Core type	Polyisocyanurate (PIR)
Product's reaction to Fire	F

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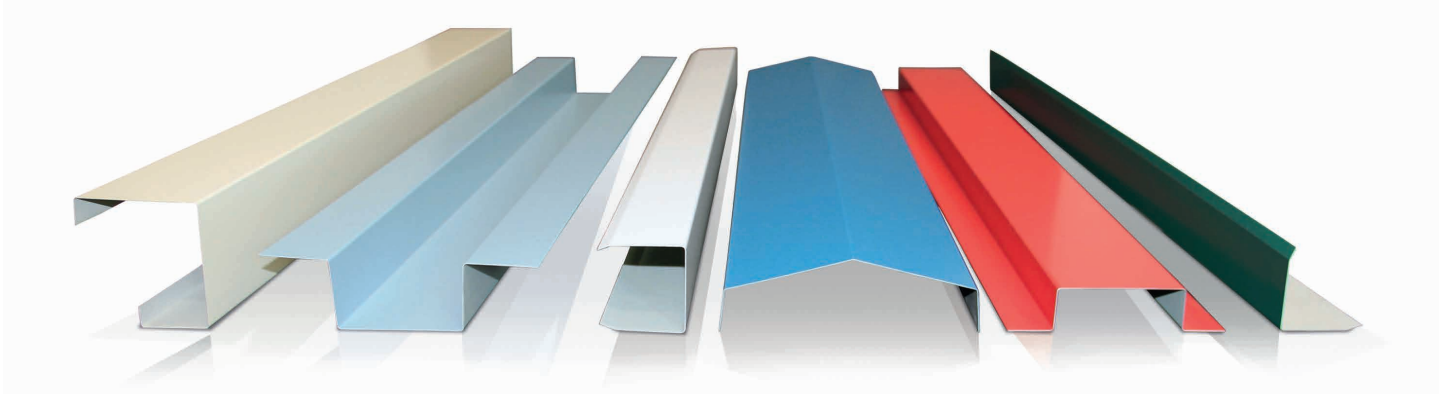
Panel thickness	R-value
mm (")	(Hr ft2 °F/BTU)
50 (1 31/32")	13.05
80 (3 5/32")	21.00
100 (3 15/16")	26.39

Flashings

Masterpanel offers a wide range of flashing pieces that can provide solutions to all kinds of construction details, achieving the functionality and aesthetics to suit the requirements of every project.

We can adapt to the design requests of our customers, and are able to carry out any cutting or folding job, whatever your requirements.



Our flashings are made from coated steel sheet according to the following standards:

- Galvanized steel according to UNE-EN 10346
- Prepainted steel according to UNE-EN 10169

We use only quality raw materials; the flashings can be manufactured in lengths up to 8.00 meters (26.24 ft), with thicknesses from 0.50 mm to 3.00 mm (gauge 26 to gauge 10) and with a variety of different finishes:

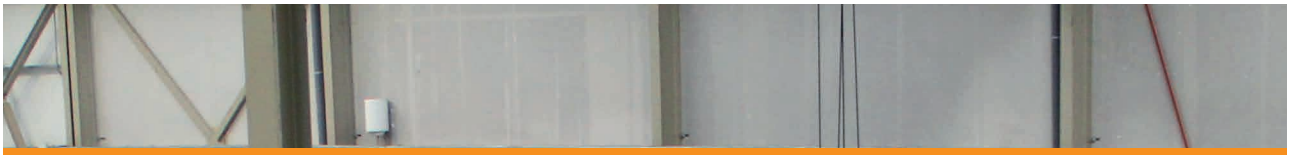
- Galvanized
- Prepainted
- Aluminum
- Copper
- Stainless steel.
- Magnelis®

	Available thickness
Galvanized	mm 0.60 / 0.80 / 1.00 / 1.20 / 1.50 / 2.00 / 2.50 / 3.00 gauge 24 / 22 / 20 / 18 / 16 / 14 / 12 / 10
Prepainted	mm 0.50 / 0.60 / 0.80 gauge 26 / 24 / 22
Wood imitation	0.60 • gauge 24
Aluminum	Available on request
Copper	
Stainless steel	
Magnelis ®	

* Consult with our sales department to learn more about the latest developments in the types and dimensions of materials.

* For more construction details about flashings, please see page 54 of this catalogue. Information is also available on our website www.magon.es

- Available colours: see colour chart.



Colour chart

bidasoa cream (*)

sand

dark wood

imitation corten

imitation concrete wood

pyrenean white (*)

oyster white

pearl grey (*)

silver metallic (*)

7016 anthracite grey

coral red

tile red (*)

baztan red

tobacco

dextar black

sky blue

lake blue

sea blue

light green

navarra green (*)

Embossed finish available for Master-F and Master-Frigo. Both on the outer face and the inner face.

• **Colours in this catalogue are approximate.**

(*) colours avalible in G90 galvanized steel. Possibility of manufacturing in other colours, from Masterpanel standard chart or from RAL chart, on request.

Guide to select the right finish:

In order to choose the right prepainted finish for each use, the planner responsible for the design of the project must take into account both the incidence of UV rays and the exposure to corrosive environments of the building or project.

- **Corrosion resistance of the paint system**

  To determine the corrosion resistance of a paint system, it is subjected to the salt spray test. This test evaluates the appearance of corrosion after a number of hours in a saline mist chamber. The results provide each paint scheme with an RC corrosion resistance value, from RC1 to RC5, with RC1 being the lowest value. This means that those RC3 rated paint schemes have shown their suitability for environments rated C3 or lower.

- **Resistance to UV radiation of the paint system**

  To determine the UV resistance of a paint system, it is subjected to the QUV accelerated aging test. This test evaluates the loss of gloss and colour over time due to UV rays. The results provide each paint scheme with a UV resistance value RUV, from RUV1 to RUV4, with RUV1 being the lowest value.

- **Classification of environments**

DESCRIPTION OF CORROSIVE CATEGORIES FOR EXTERNAL ENVIRONMENTS

C1 Very low

C2 Low: Areas with low level of contamination. Mainly rural or industrial areas without incidence by sulphur dioxide.

C3 Moderate: Urban and industrial areas with low sulphur dioxide (SO2) pollution and coastal areas with low salinity (from 10 km to 20 km from the sea).

C4 High: Industrial areas with moderate contamination by sulphur dioxide (SO2) and coastal areas with moderate salinity (from 3 km to 10 km from the sea).

C5 I Very high: Industrial areas with very aggressive atmospheres and high contamination by sulphur dioxide (SO2)

C5 M Very high: Coastal and maritime areas with high salinity (from 1 km to 3 km from the sea).

Corrosive environment category	Environment type			
	Rural	Urban	Industrial	Marine
C1 - very low				
C2 - low				
C3 - moderate			SO_2 low	(10-20 km)
C4 - high			SO_2 moderate	(3-10 km)
C5 I - very high			SO_2 high	
C5 M - very high				(1-3 km)

DESCRIPTION OF THE CATEGORIES OF UV RESISTANCE FOR EXTERNAL ENVIRONMENTS

Area 1: Areas not exposed to UV radiation. Indoor use without any radiation.
Area 2: Areas with low exposure to UV radiation or without special colour maintenance requirements.
Area 3: Areas with moderate exposure to UV radiation.
Area 4: Areas with high exposure to UV radiation or with special colour maintenance requirements.

- **Choice of finishes for different environments**

  Once the category of the environment is known, the person responsible for the design must decide on the painting system:

1) The suitable paint system needs to be determined in terms of corrosion. The following table can be used as a guide.

				Poliéster	PVDF	PU55
Categoría de resistencia a corrosión				RC3	RC4	RC5
Exterior environment type	Rural		C2	✓	✓	✓
	Urban		C3	✓	✓	✓
	Industrial	Low contamination	C3	✓	✓	✓
		Moderate contamination	C4	X	✓	✓
		High contamination	C5	X	X	✓
	Marine	10 - 20 km	C3	✓	✓	✓
		3 - 10 km	C4	X	✓	✓
		1 - 3 km	C5	X	X	✓

2) The suitable paint system in terms of UV radiation have to be determined. The following table can be used as a guide.

		Polyester	PVDF	PU55
Categoría de resistencia UV		RUV2	RUV4	RUV4
Exterior environment type	Area 1	✓	✓	✓
	Area 2	✓	✓	✓
	Area 3	X	✓	✓
	Area 4	X	✓	✓

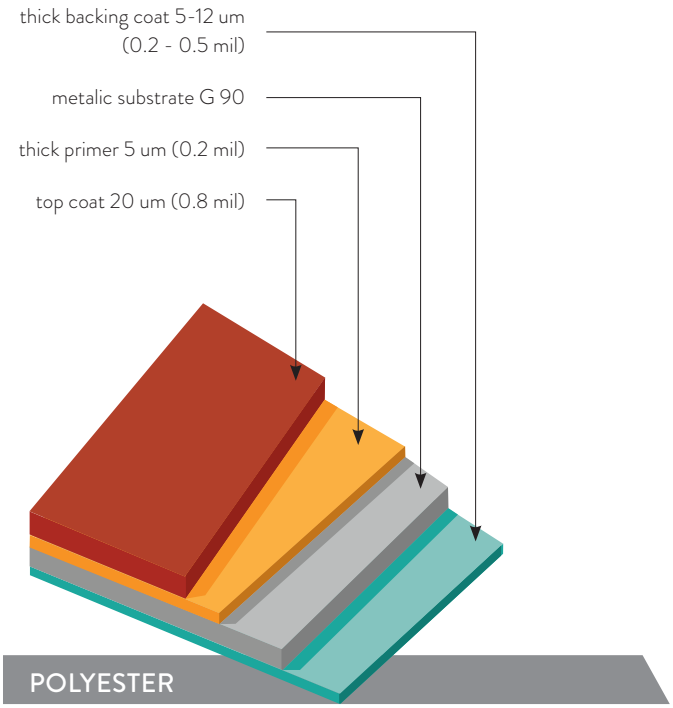
3) A suitable paint system should be chosen in terms of both corrosion resistance and UV resistance. The following cases can be used as a guide..

Corrosion resistance category	UV resistance category	Choice
C3	area 2	Polyester
C4	area 4	PVDF
C5	area 3	PU55

The data stated in the tables is informative and does not constitute a guarantee of the material. You should contact Masterpanel about any applications which require a guarantee for the steel in the panels.

Guide to select the right finish:

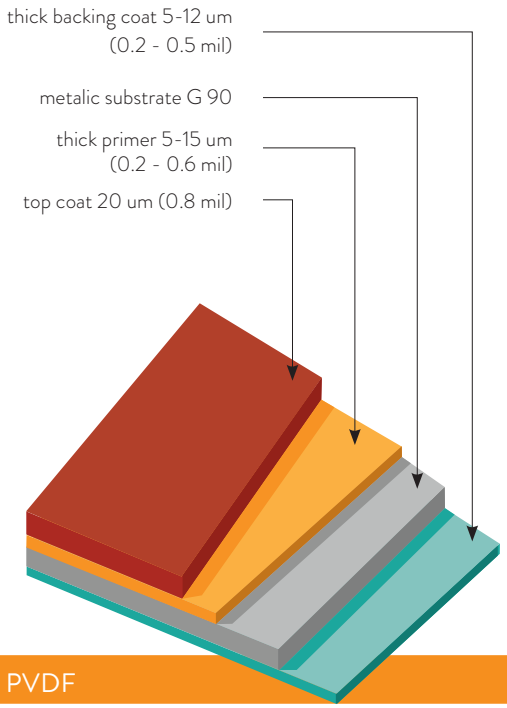
FINISHES	POLYESTER
MAIN PROPERTIES:	HIGH RESISTANCE TO CORROSION
	HIGH RESISTANCE TO UV RADIATION
	GOOD FORMABILITY
	GOOD STABILITY OF COLOURS AND APPEARANCE
	INTERIOR AND EXTERIOR USE
APPLICATION:	STANDARD FINISH FOR ALL TYPES OF ROOFING, FACADES, COLD STORES AND ACCESSORIES
SURFACER APPEARANCE:	SMOOTH
THICKNESS:	25 MICRONS (1 MIL)
OUTER FACE COMPOSITION	5 MICRONS PRIMER + 20 MICRONS OF FINISHING COAT



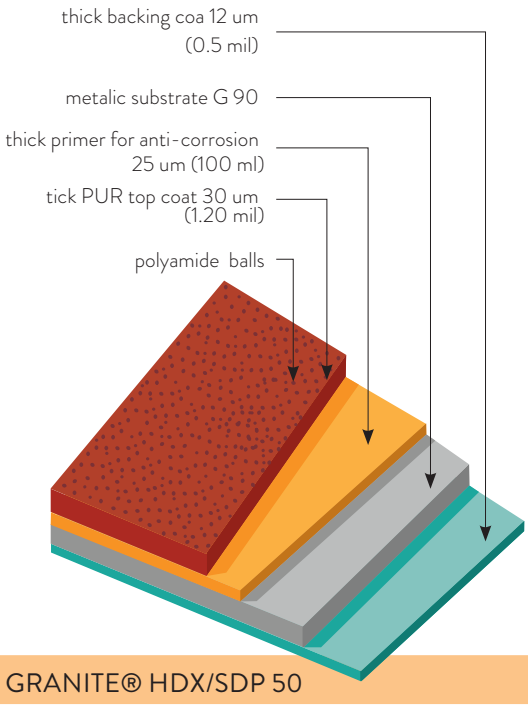
NOTES:

- Standard finish 25 um Polyester. Other finishes available on request.
- Orders outside the standard range of colours have a minimum requirement of 10,760 sqft.

PVDF	GRANITE® HDX/SDP 50
VERY HIGH RESISTANCE TO CORROSION	EXCELLENT RESISTANCE TO CORROSION
EXCELLENT RESISTANCE TO UV RADIATION	EXCELLENT RESISTANCE TO UV RADIATION
GOOD FORMABILITY	VERY COOD FORMABILITY
EXCELLENT STABILITY OF COLOURS AND APPEARANCE	STABILITY OF COLOURS AND APPEARANCE
INTERIOR AND EXTERIOR USE	INTERIOR AND EXTERIOR USE
SPECIAL FINISH, WITH VERY HIGH RESISTANCE TO CORROSION AND HIGH STABILITY OF COLOURS, FOR ALL TYPES OF ROOFING, FACADES, COLD STORES AND ACCESSORIES	RECOMENDED FINISH FOR HARSH ENVIRONMENTS, COASTAL AREAS AND / OR SEVERE WEATHER CONDITIONS, FOR ITS EXCELLENT RESISTANCE TO CORROSION
SMOOTH	GRANULATED
25-35 MICRONS (1 MIL / 1.38 MIL)	55 MICRONS (2.16 MILS)
5 MICRONS PRIMER + 20 MICRONS OF FINISHING COAT	25 MICRONS PRIMER + 30 MICRONS PURE COATING



PVDF



GRANITE® HDX/SDP 50

- The colours in this catalogue are approximate.
- Metallic coating are directional. Panels and trims must be installed oriented in the same directions to avoid preceived colours variances.

A Master Panel for every requirement

MASTER PANEL

Recommendations:

Masterpanel offers our clients a technical department to support your designers and Project Management. Our building system section provides support from the initial concept of the project to the installation and subsequent maintenance.

This advice may include:

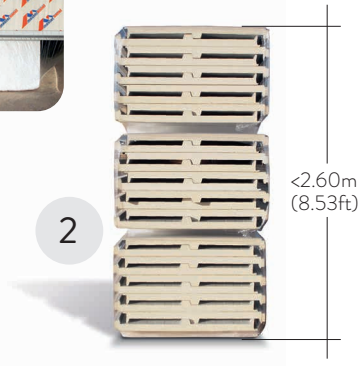
- Proposals for appropriate technical solutions for each project..
- Providing support regarding the cutting, quantifications of the panels and necessary accessories.
- Support and technical information for the training of fitters.
- We provide plans and sketches of the most common technical details.
- Technical support in the correct installation of our panels, forming a team with the Project Management.

TRANSPORT AND LOADING

- Panels must always be transported on flatbed vehicles.
- Panels will always be packed with polystyrene blocks at the base to avoid damage **(pict. 1)**.
- Panel stacks should never exceed 2.60m (8.53ft) high (including polystyrene blocks, accessories, cover caps, trims, etc) **(pict. 2)**.

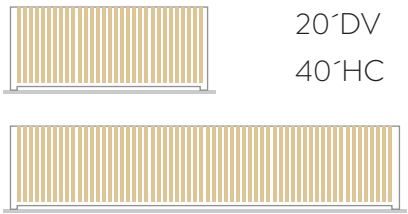
By truck:

1



2

In containers:

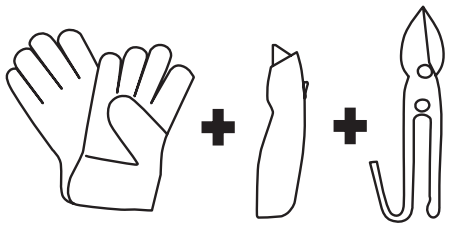


HANDLING

Manual unloading :

- The staff will always handle the panels with safety gloves **(pict. 3)**.
- Appropriate tools should be used to remove the panel packaging. **(pict. 4)**.
- The storage area must be defined in advance. Always store on a firm, level surface free of debris (see recommendations for storage).
- Always move panels one by one. The manipulation of the panel will be done by lifting them, they must never be dragged since the edges of the panel can cause damage to the next panel.
- Panels should always be moved while held in a vertical position. Auxiliary slings can be used **(pict. 5)**.
- The packages should never be stacked directly on the ground, vegetation or earth **(pict. 6)**.
- Panels will be stacked on site, one panel on top of the other and facing each other **(pict. 7)**.

3



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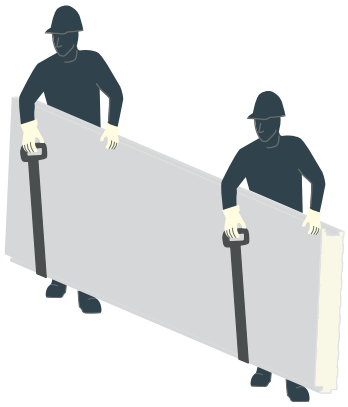

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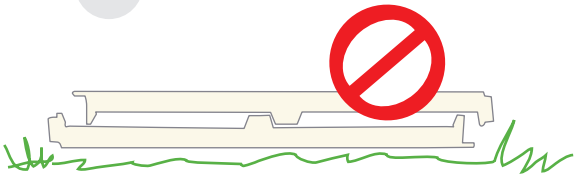

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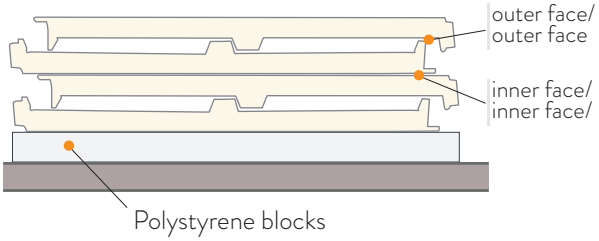
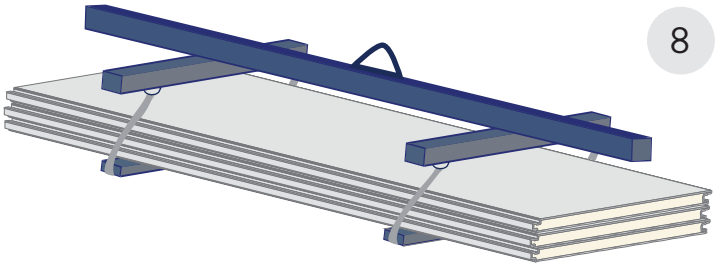


Recommendations

Crane unloading:

- Staff who handle panels should always wear safety gloves.
- The crane must be operated by a qualified person who holds the necessary permits and licences.
- We recommend you always use a balance beam cradle or unloading cradle. **(pict. 8)**.
- Panels should be lifted when held with slings, ensuring there is a minimum of two supports along the pack.
- We suggest that you place protection on the edges of the pack at the points where it is held by the slings, rigid spacers may be used with a length greater than the panel width.
- It is recommended to unload with at least 4 supports on panels longer than 8.00m (26.24ft) to limit the arrow of the panels.
- Metal chains should never be used as they can mark and damage the panels.

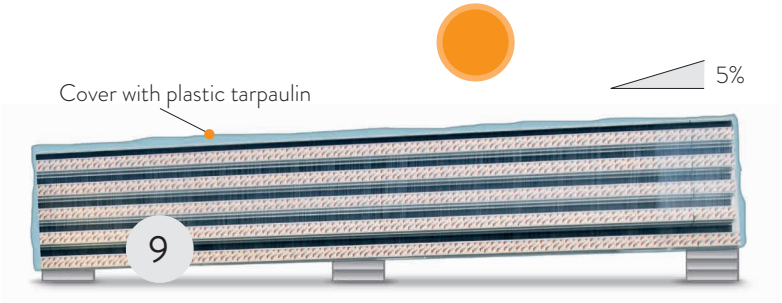


8

STORAGE:

Short term:

- Packs and panels should never be stacked directly in contact with the ground or vegetation **(pict. 7)**.
- The storage area should be dry and ventilated.
- If covered storage is not possible, the panels should be stored with an inclination of 5% to avoid the accumulation of water in the package. Make cuts in the stretch plastic packaging so as to allow the escape of any water that may accidentally enter. Packages must be covered with waterproof material, canvas or plastic **(pict. 9)**.
- The protective film must be removed from the surface of the panel in a period not exceeding 15 days from their exposure to the elements **(pict. 10)**.
- Panel that are stored in packs are sensitive to moisture, condensation and rain. The water that accumulates between the panels could create zinc hydrocarbon on the surface, which in the case of prepainted panels will be seen as surface staining. To avoid this, place spacers between panels. Accumulated water can in turn damage the paint on the panels, causing it to peel.
- The stacking height should never exceed 2.20m (7.22ft).

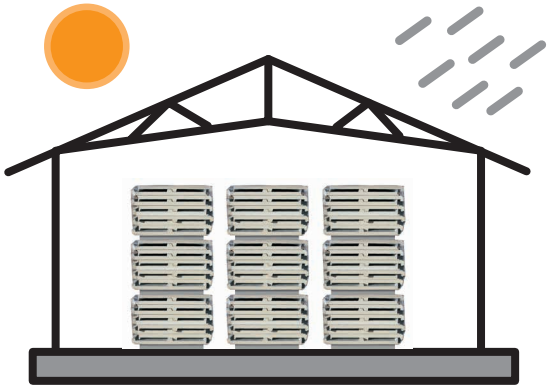


9

10

Long term:

- Follow the short-term storage recommendations (except the third recommendation in the previous section). The storage area should be dry, ventilated and covered. Under no circumstances should panels suffer long-term exposure to the elements **(pict. 11)**.
- Remove the stretch plastic wrapping from the panel packaging to prevent the accumulation of moisture, or condensation inside the package.



11

PANEL CUTTING:

1. Working tool:

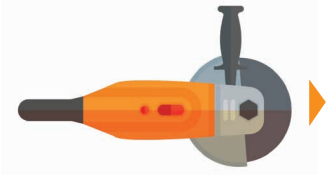
Operators must be equipped with the pertinent individual protection equipment (glasses, gloves, long sleeves...)

Panel cutting must be done with the proper tools. Do not use tools that produce hot sparks. The use of inappropriate tools can cause delamination, causing long-term defects on the panel surface, such as blistering.

Suitable tools:

Fine tooth circular saw

Avoid the cut with:



Abrasive saws, grinders or similar

Jigs saw, saber or similar

2. Working surface

Panel cutting must be done on a flat surface.

The insulated metal panel should never be used as a work surface for cutting another insulated panel or other element. The remains of this cut can stay on the panel and lead to oxidation on the surface of the panel.

Recommendations

3. Cutting procedure

Masterpanel advises against cutting panels on site and cannot guarantee the performance of panels cut on site. During the cutting of the panel, its technical characteristics are modified, as well as, stresses and vibrations being transmitted, which can lead to long-term defects on the surface, such as blistering.

If the client requires the cutting of the panel on site, it is advisable to follow the following steps to avoid damaging the panel surface:

3.1 Place the panel on a flat surface.

3.2 Clean the area to be cut.

3.3 Determine the line of the cut.

3.4 Placing adhesive tape on the line of the cut is recommended in order to protect the surface and avoid scratches on it. Such tape must be removed prior to panel installation.

3.5 Cut along the previously determined line.

3.6 Clean the cutting area of any impurities, chips, etc.

3.7 Polish the edges removing burrs.

If the width to be cut is less than 50% of the panel width, it is recommended to cut the full thickness of the panel and remove the cut part before installing the panel.

When the width to be cut is greater than 50% of the width of the panel or when areas that may compromise the stability of the panel are removed before installation, it is recommended to proceed as follows:

- First, it is recommended to cut the inner face sheet and the foam to a depth of about 5-6mm (0.25").
- Then turn the panel over and cut the veneer on the outer side and the foam to a depth of about 5-6mm (0.25").
- Without removing the cut area, install the panel, fixing it to the structure as it has been designed.
- Once installed, use a utility knife to cut the foam from the cut area and remove.

In any case, after cutting the panel, the core should never be exposed. Therefore, the core must be protected by sealing systems, collars, finials, etc.

COATING REPAIR

When damage occurs during the handling of the panels that affects the coating, proceed as follows:

- **When the zinc coating is visible:**
  1. Clean the surface to be repaired
  2. Apply an epoxy-polyurethane type primer on the affected area
  3. Apply a coat of acrylic-polyurethane paint over the primer in the same shade as the repaired surface
- **When painting over pre-lacquered paint:**
  1. Clean the surface to be repaired.
  2. Apply a coat of acrylic-polyurethane paint in the same shade as the repaired surface

MAINTENANCE

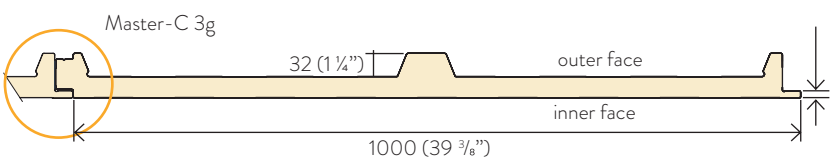
Once the panels have been fitted on-site, a general cleaning should be performed. Be sure to remove all metal chips or burrs and any objects, metallic or otherwise, that may be on the surface, so as to remove possible focal points for the formation of rust. If necessary, use a mild household detergent without caustic soda.

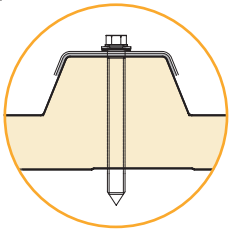
Before starting any maintenance work, please remember that our roofing is not designed for frequent heavy walking, but just for walking on occasionally; always avoid stepping on flashings, ridges and any installed trim, always wear rubber-soled shoes and safety gloves; do not drag equipment or tools along the surface of the roofing..

- Inspect gutters and downpipes semi-annually.
- Carry out a general cleaning annually, including the skylights. If necessary, use mild household detergent, without caustic soda. Do not use brushes, metal scouring pads or other abrasive materials.
- Make an annual check on the condition of mouldings and trims, sealants and screw fittings that are exposed to the elements.
- Inspect the areas of sheet overlaps, the state of the sealant and of the screw fittings and, if necessary, reseal.
- If lightning conductors are installed, make an annual inspection of the condition of the installation.
- On panels with a polyester type paint finish, check the condition of the paint every two years. In special finishes, the first paint check should be carried out starting on the fifth year.

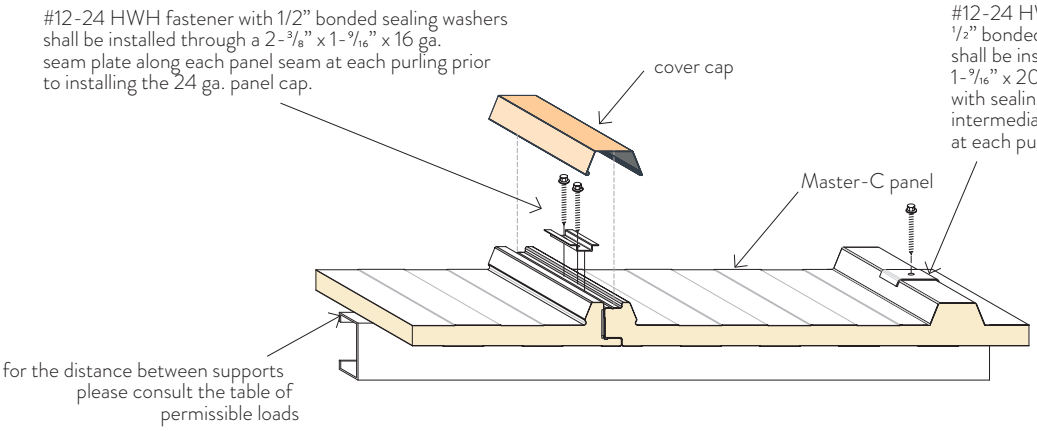
Technical assistance:

MASTER-C TYPE PROFILES AND JOINT:

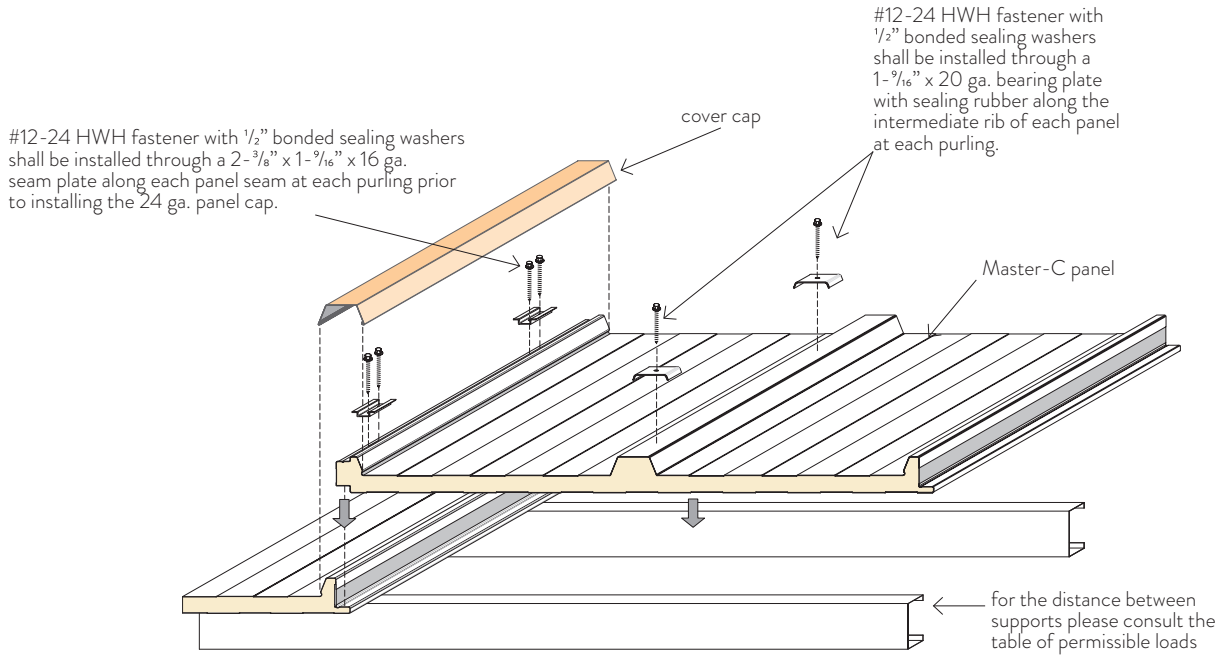




fixing details:

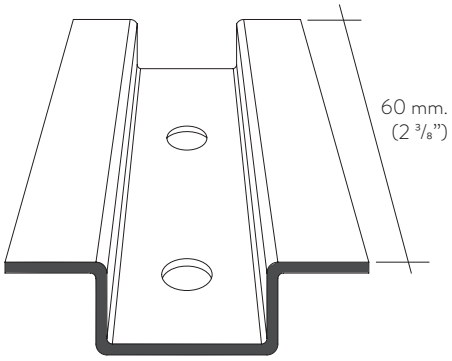


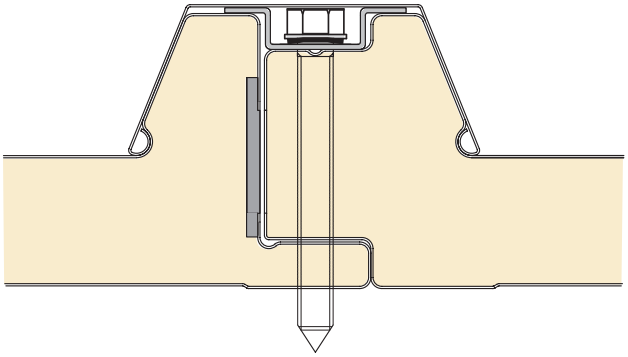
EXPLODED VIEW OF A MASTER-C JOINT:

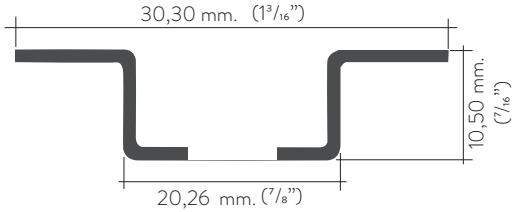


MASTER-C FIXING OPTIONS:

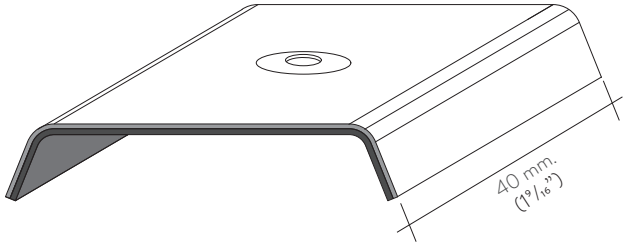
SEAM PLATE:

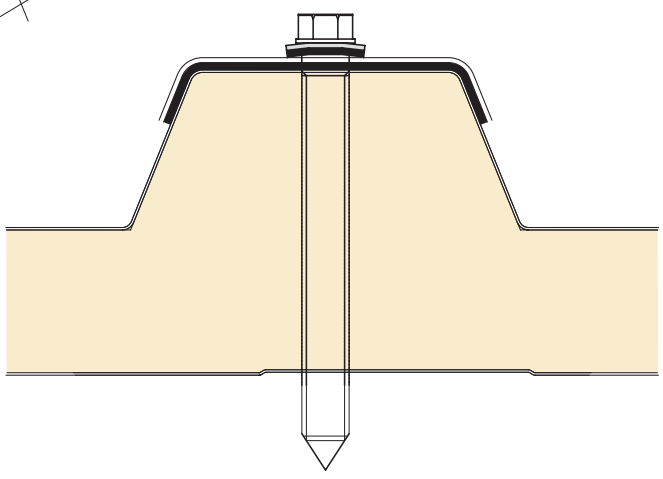


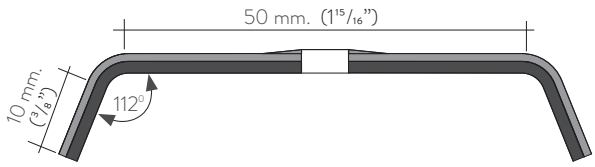




BEARING PLATE:







Technical assistance:

PANEL OVERLAPS:

a solution to be used when the length of roofing is greater than the maximum transportable: national = 16.00m and export = 39'

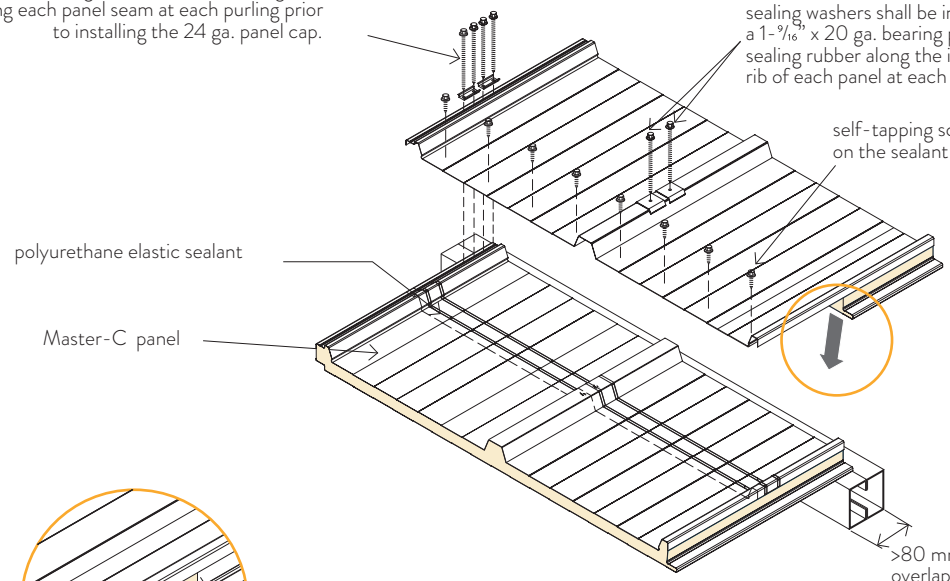
#12-24 HWH fastener with ½" bonded sealing washers shall be installed through a 2-⅜" x 1-⁹⁄₁₆" x 16 ga. seam plate along each panel seam at each purling prior to installing the 24 ga. panel cap.

#12-24 HWH fastener with ½" bonded sealing washers shall be installed through a 1-⁹⁄₁₆" x 20 ga. bearing plate with sealing rubber along the intermediate rib of each panel at each purling.

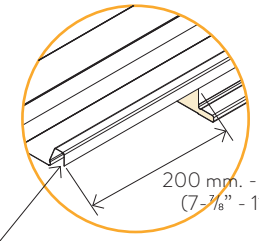
self-tapping screws located on the sealant line

polyurethane elastic sealant

Master-C panel



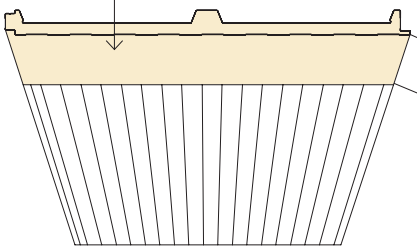
>80 mm. (3-⁵⁄₃₂") overlap



200 mm. - 300 mm. (7-⅞" - 11-¹³⁄₁₆")v

remove lower face and polyurethane

Cutting can be in-factory (optional) or on site



200 mm. - 300 mm. (7-⅞" - 11-¹³⁄₁₆")

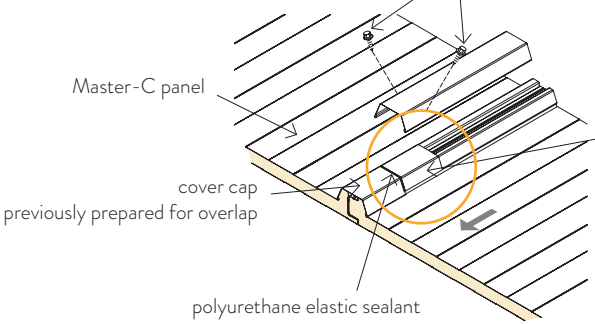
COVER CAP OVERLAPS:

self-tapping screws one on each side of the overlap

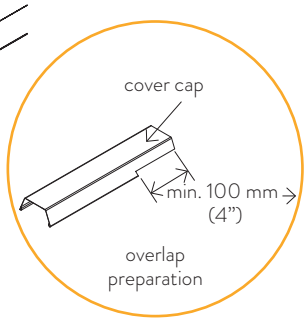
Master-C panel

cover cap overlap must never coincide with panel overlap

cover cap previously prepared for overlap

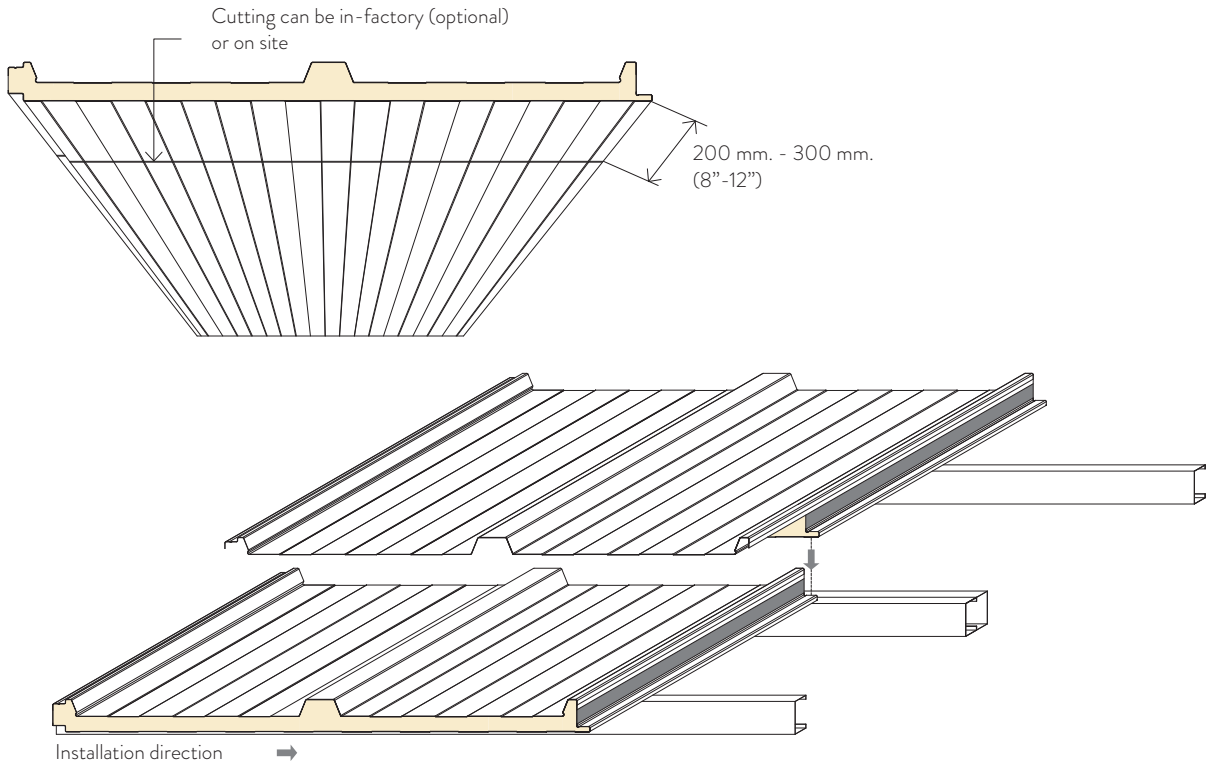


polyurethane elastic sealant

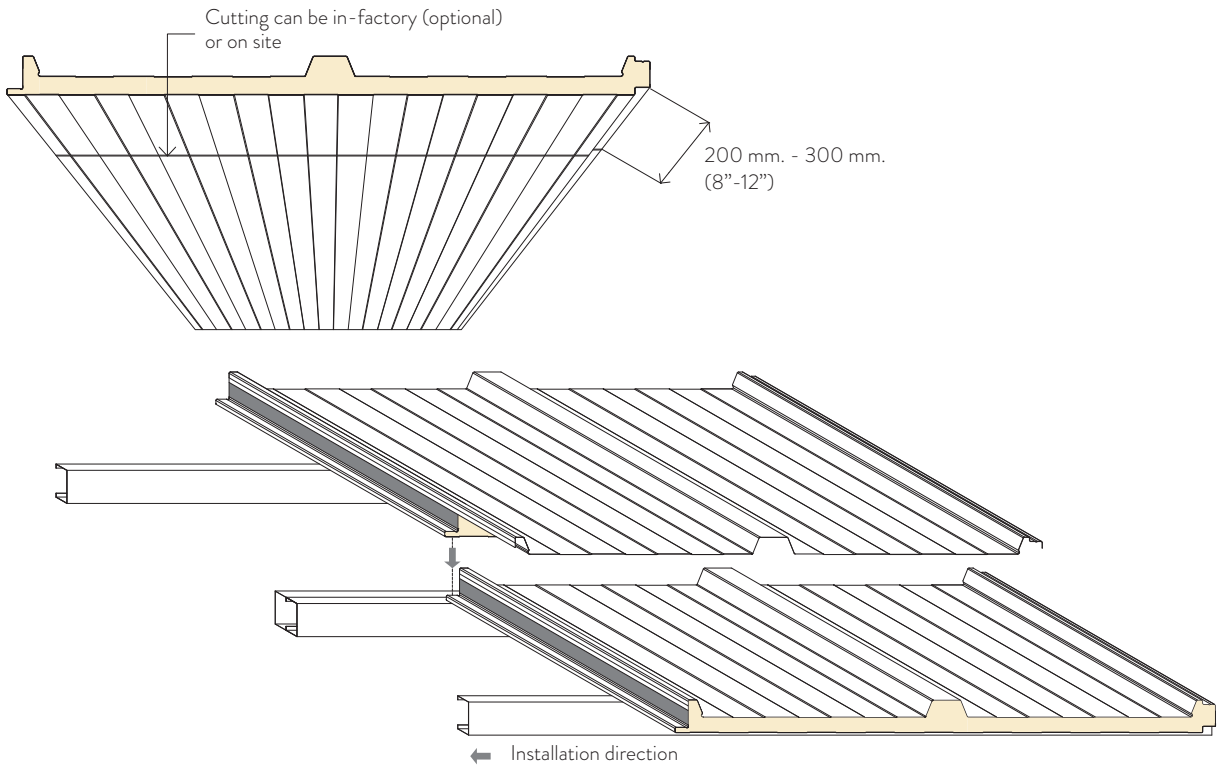


manually cut a slot of 100 mm (4") minimum (both lower sides of the cover cap)

RIGHT OVERLAP:

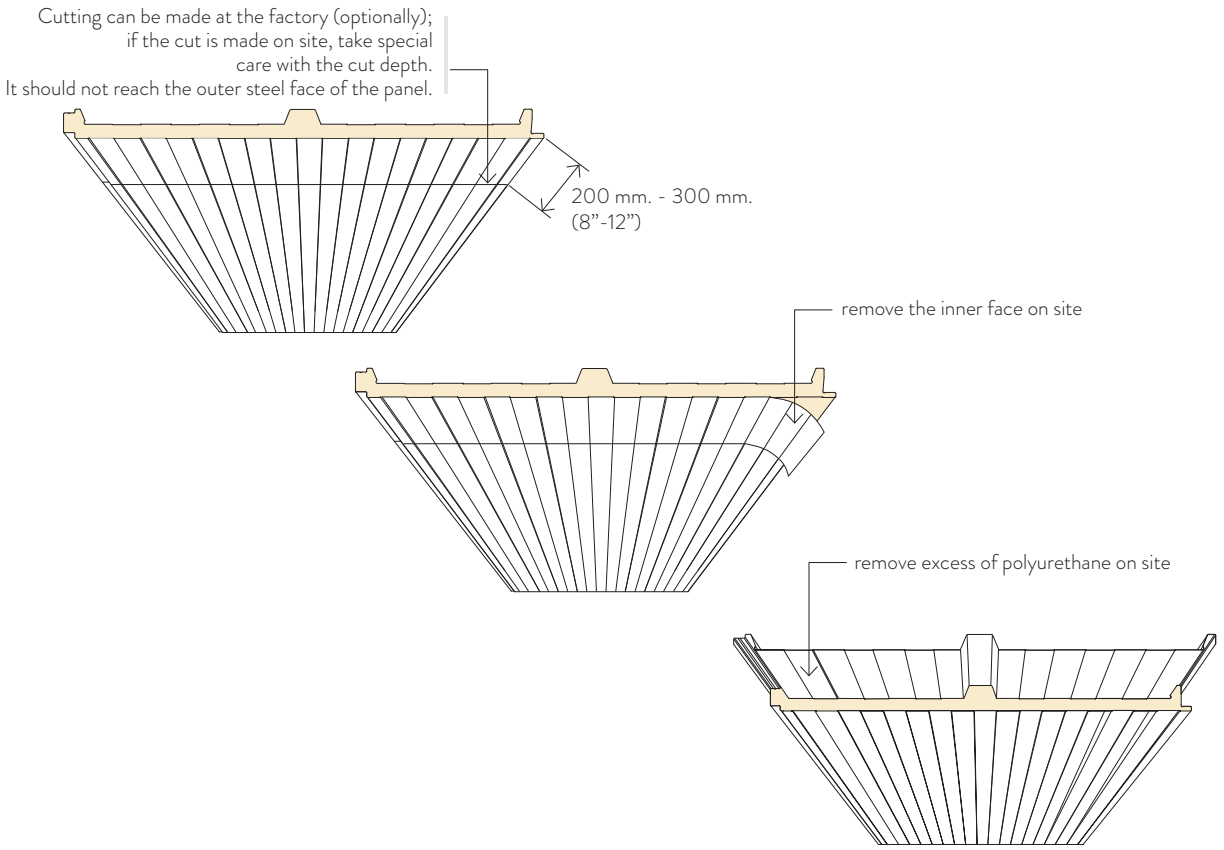


LEFT OVERLAP:

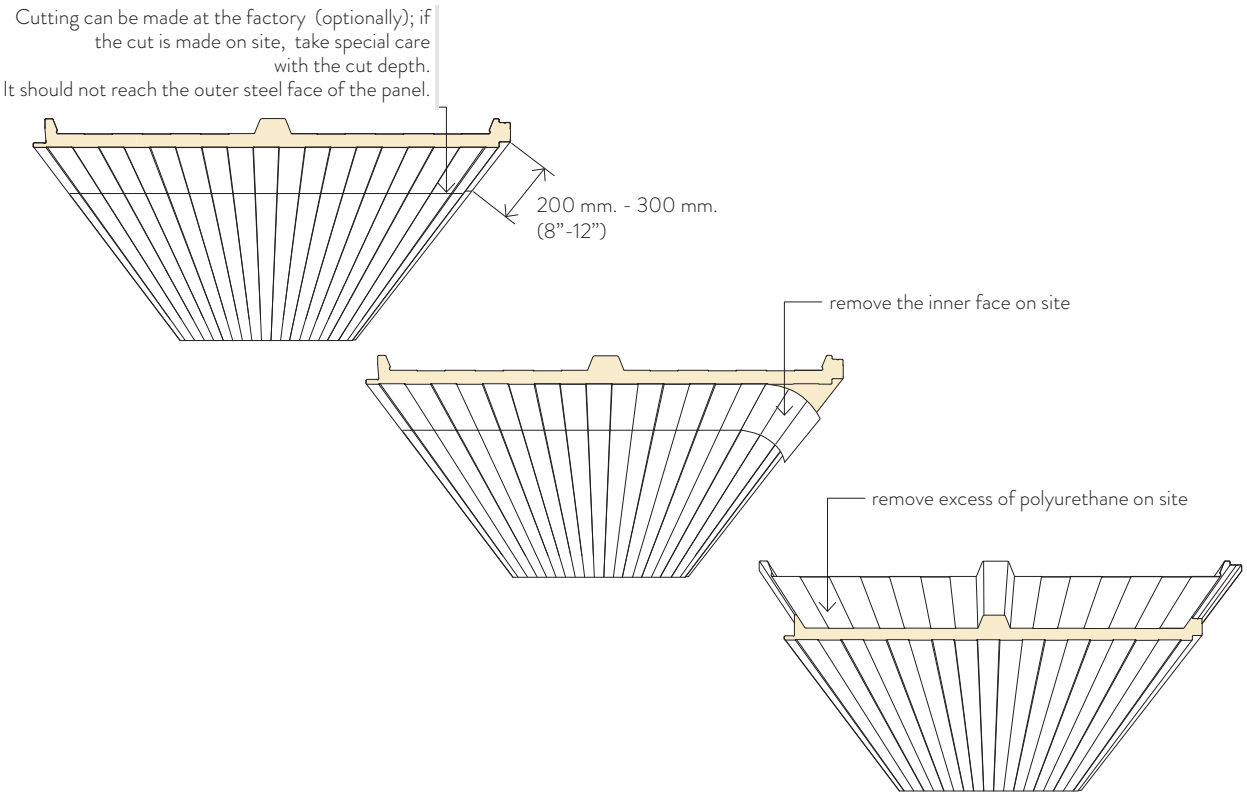


Technical assistance:

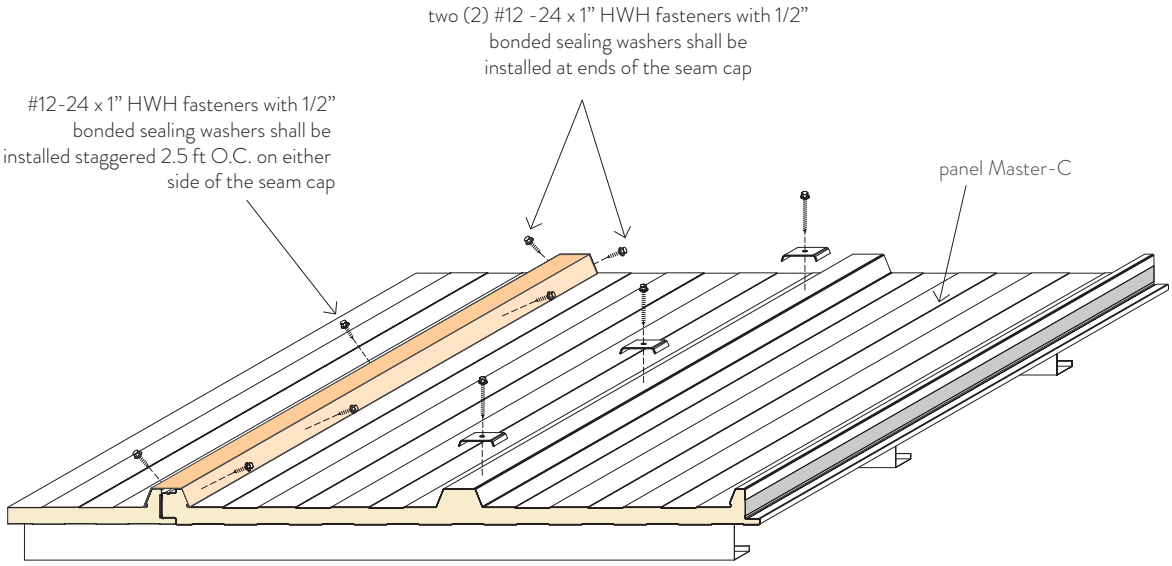
PANEL PREPARATION FOR RIGHT OVERLAP:



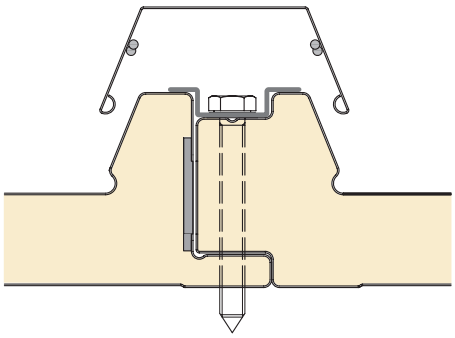
PANEL PREPARATION FOR LEFT OVERLAP:



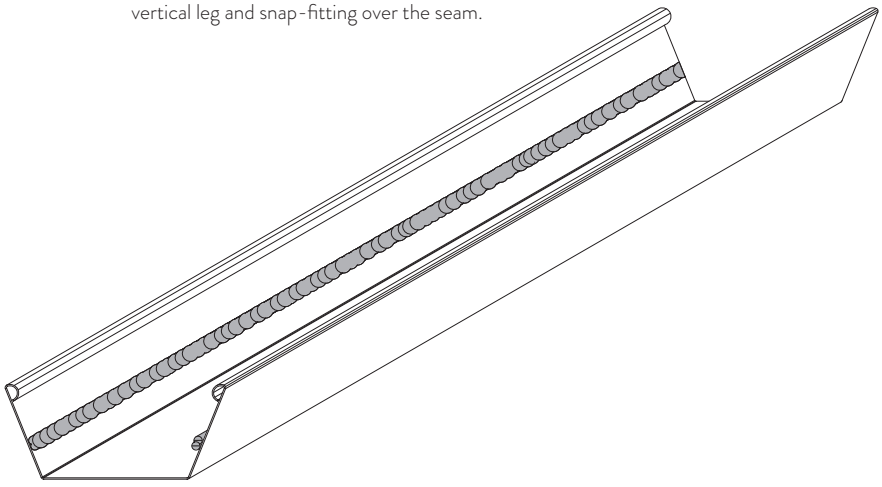
COVER CAP FIXING DETAILS:



ASTM E 2140 TEST METHOD FOR WATER PENETRATION

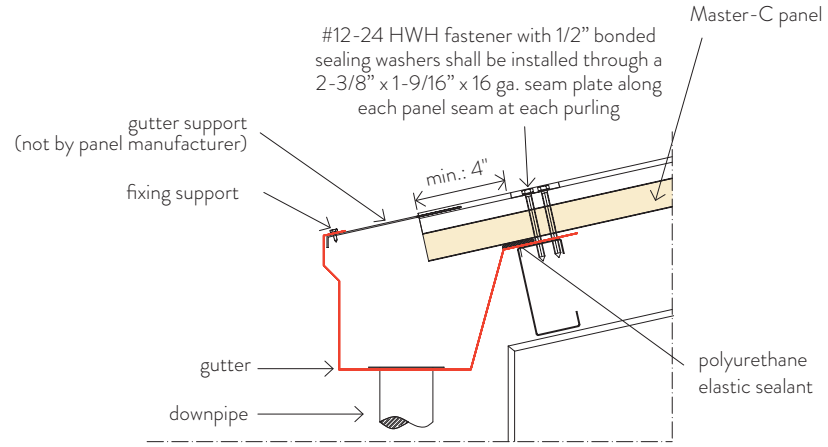


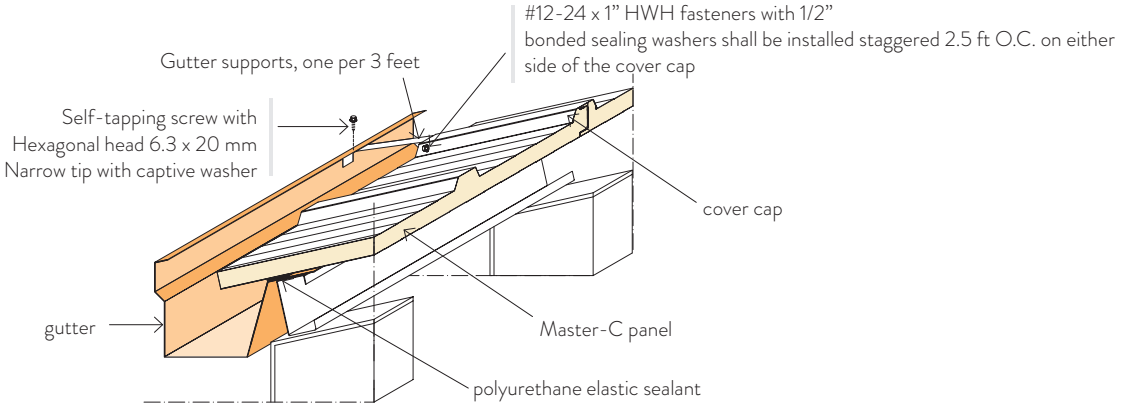
two (2) # 12- 24 x 4-1/4" HWH fasteners with 1/2" bonded sealing washer were installed through a 2-3/8" x 1-9/16" x 16 ga. bearing plate along each panel seam at each purlin prior to installing the 24 ga. steel cap. The cap was installed by aplliying a continuous 3/4" wide bead of Bostik 915 FS TM to the inside of each vertical leg and snap-fitting over the seam.



Technical assistance:

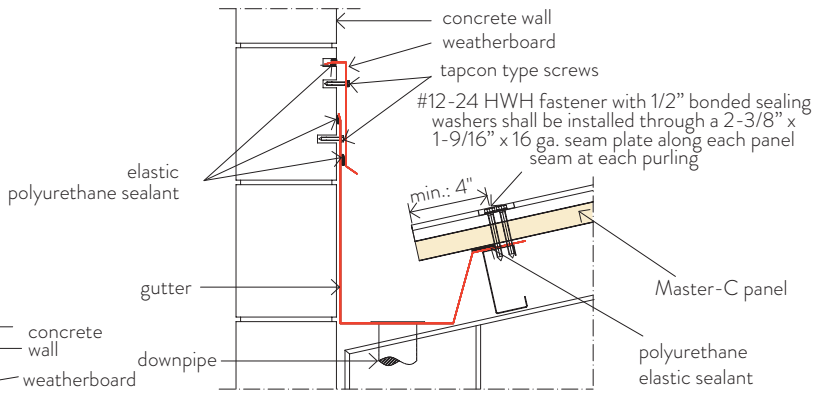
EXTERIOR GUTTERING:

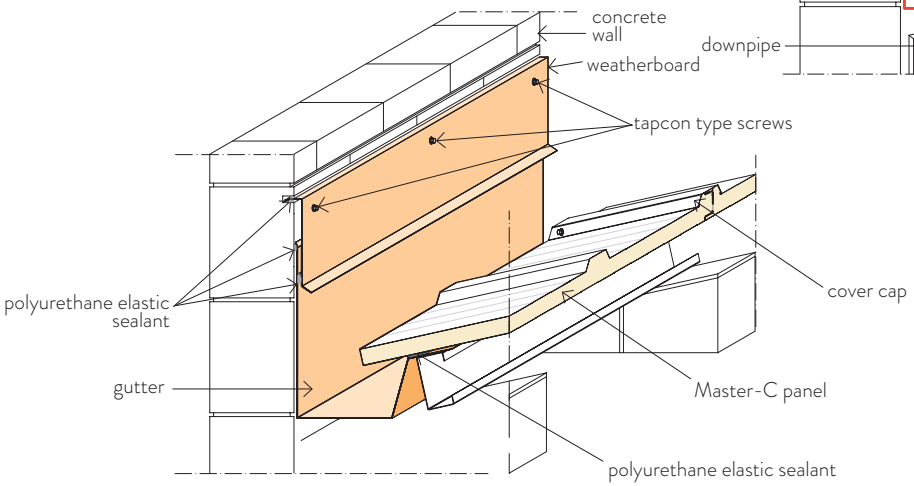




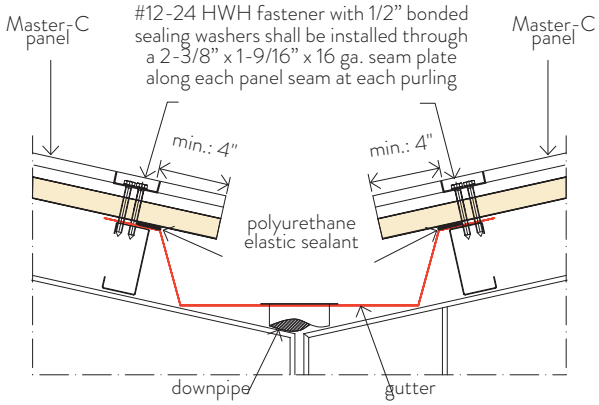
INTERIOR GUTTERING ON CONCRETE WALLS:

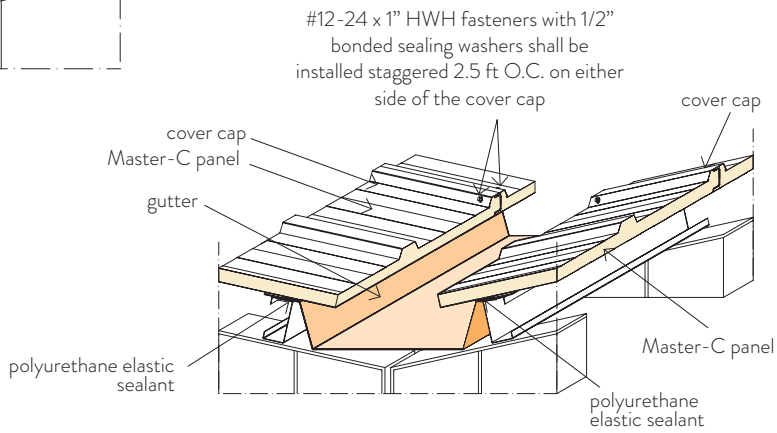
Detail not recommended in geographical areas where the maximum value of rain intensity > 8 inches/hour. hour.



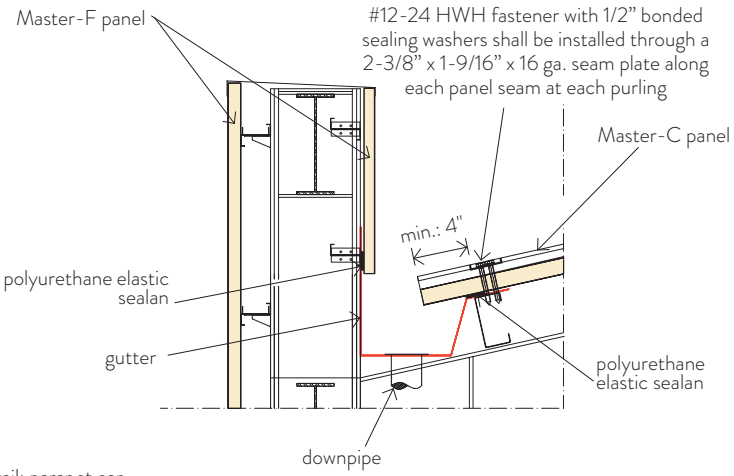


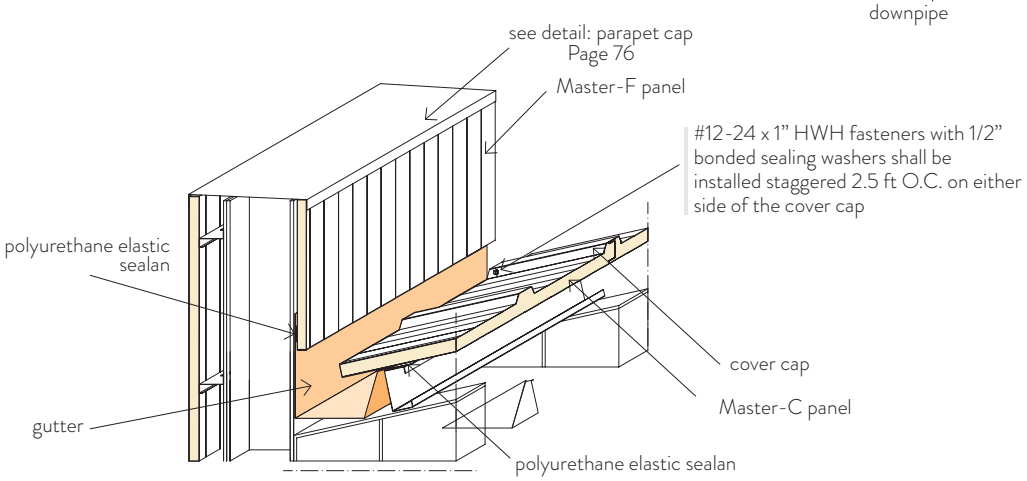
CENTRAL GUTTERING:





INTERIOR SIDE GUTTERING



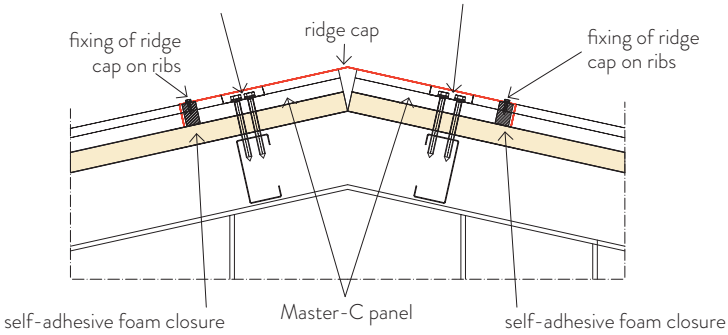


Technical assistance:

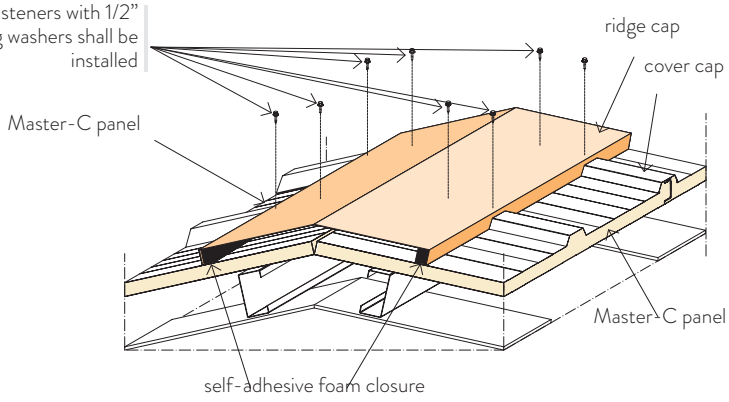
RIDGE CAP:

#12-24 HWH fastener with 1/2" bonded sealing washers shall be installed through a 2-3/8" x 1-9/16" x 16 ga. seam plate along each panel seam at each purling

#12-24 HWH fastener with 1/2" bonded sealing washers shall be installed through a 2-3/8" x 1-9/16" x 16 ga. seam plate along each panel seam at each purling

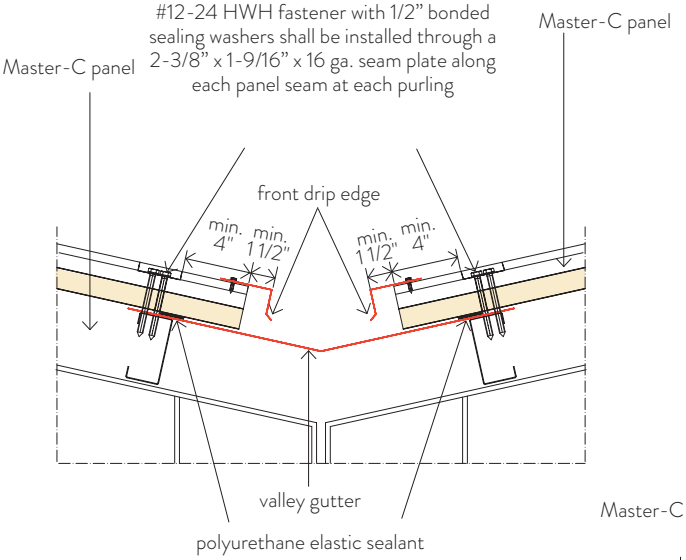


#12-24 x 1" HWH fasteners with 1/2" bonded sealing washers shall be installed

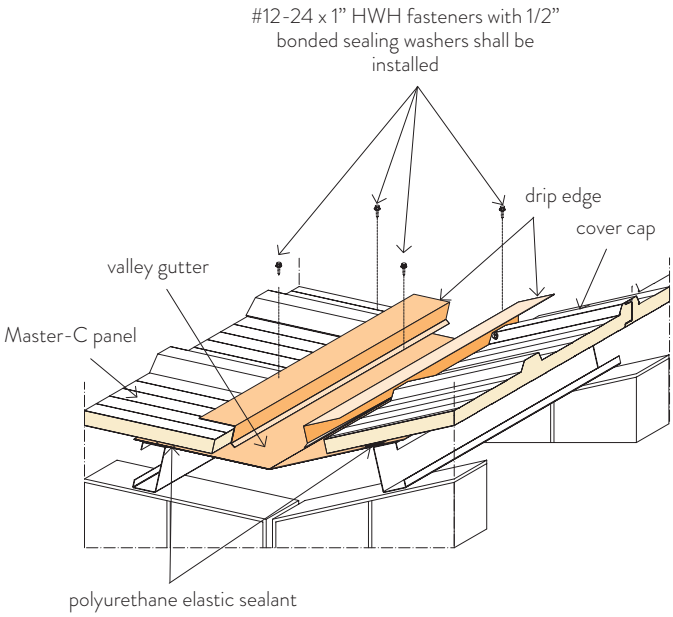


VALLEY GUTTER

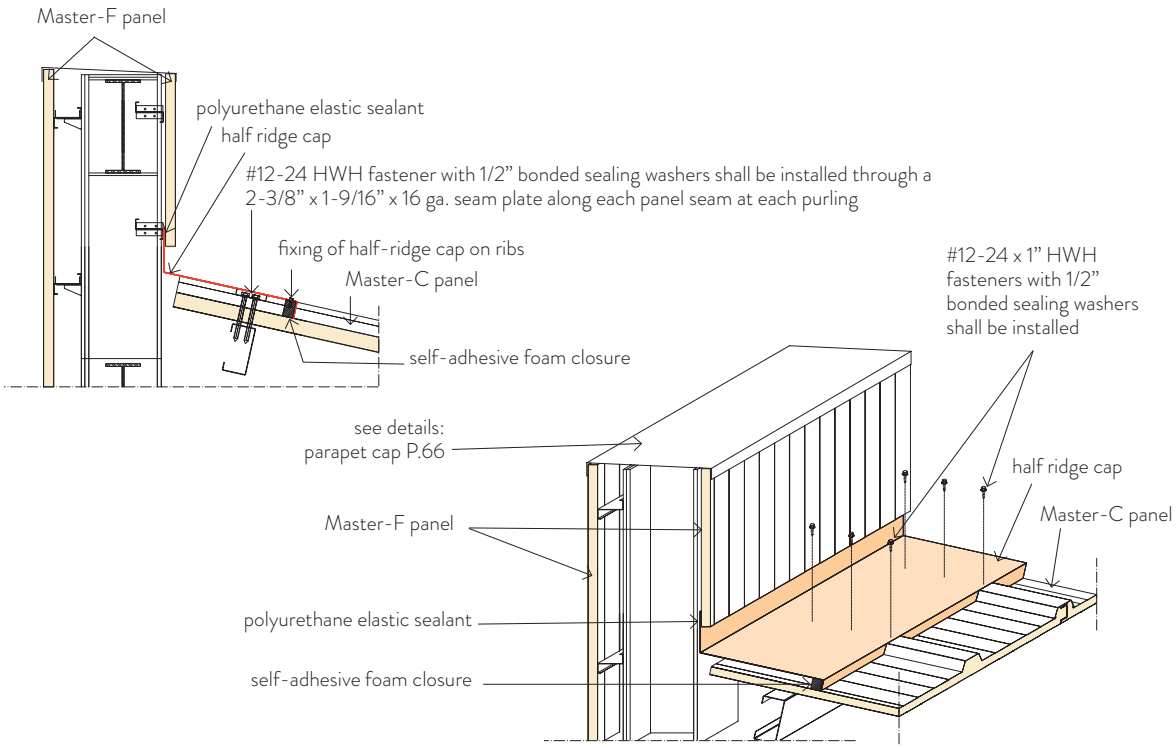
#12-24 HWH fastener with 1/2" bonded sealing washers shall be installed through a 2-3/8" x 1-9/16" x 16 ga. seam plate along each panel seam at each purling



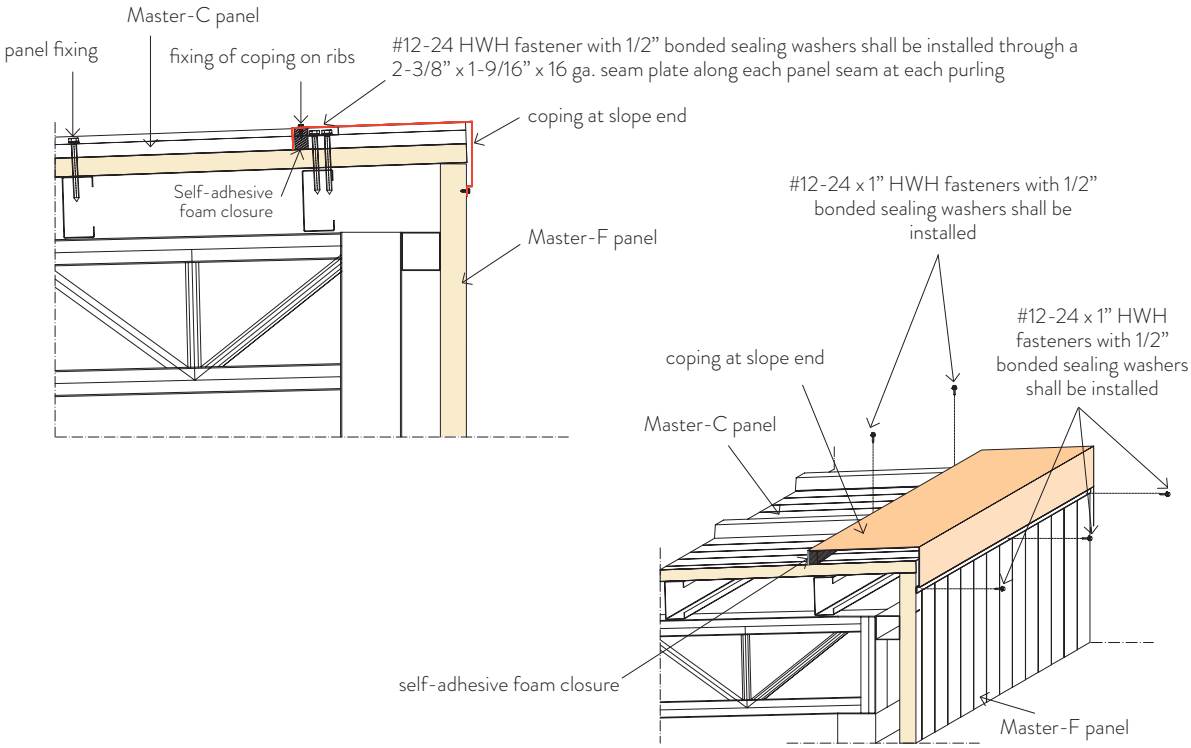
#12-24 x 1" HWH fasteners with 1/2" bonded sealing washers shall be installed



TOP OF SLOPE TO WALL:

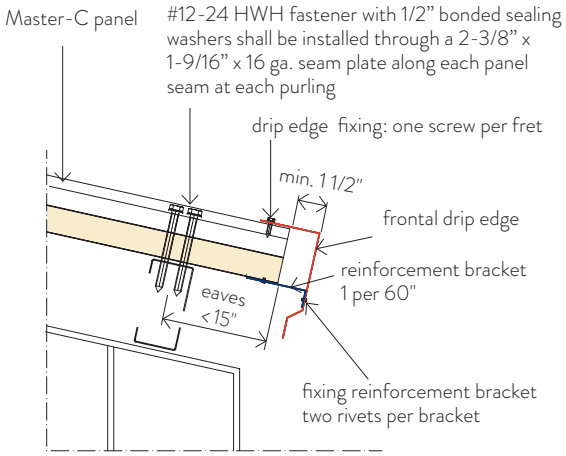


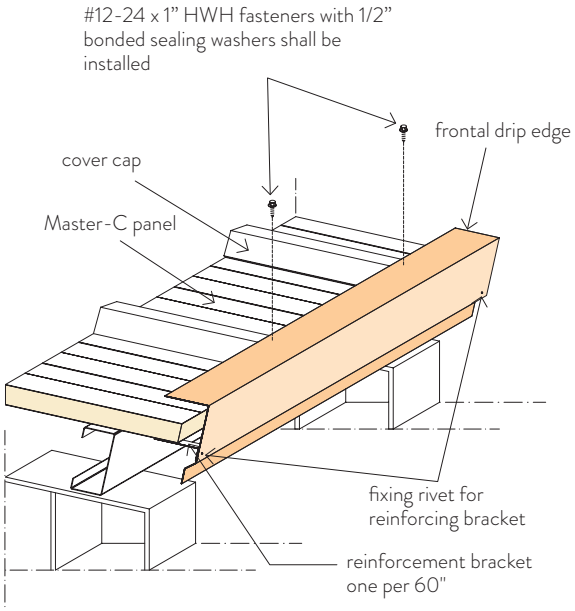
COPING FOR SLOPE ENDS:



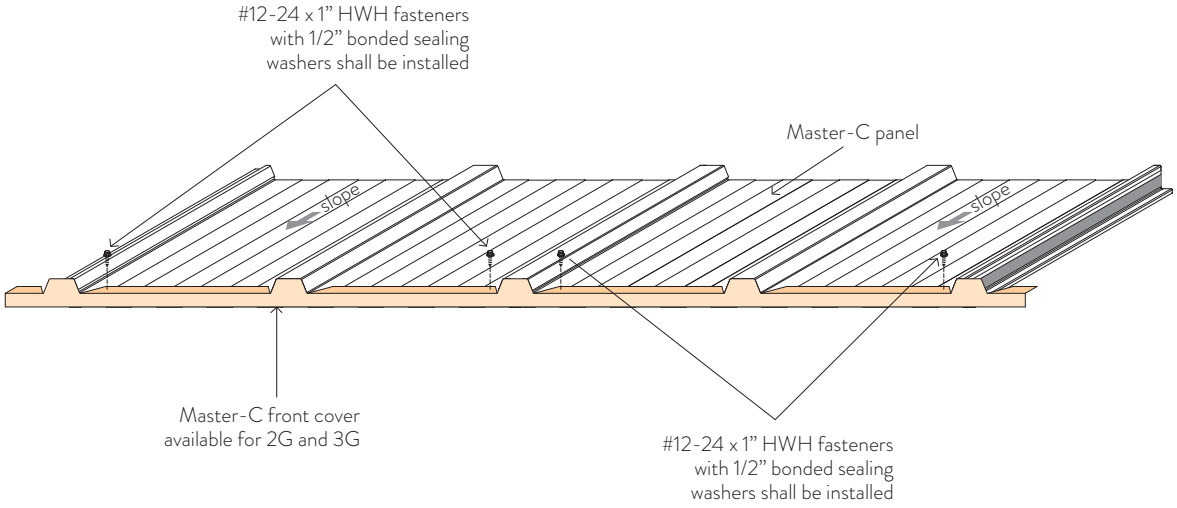
Technical assistance:

FRONTAL DRIP EDGE:

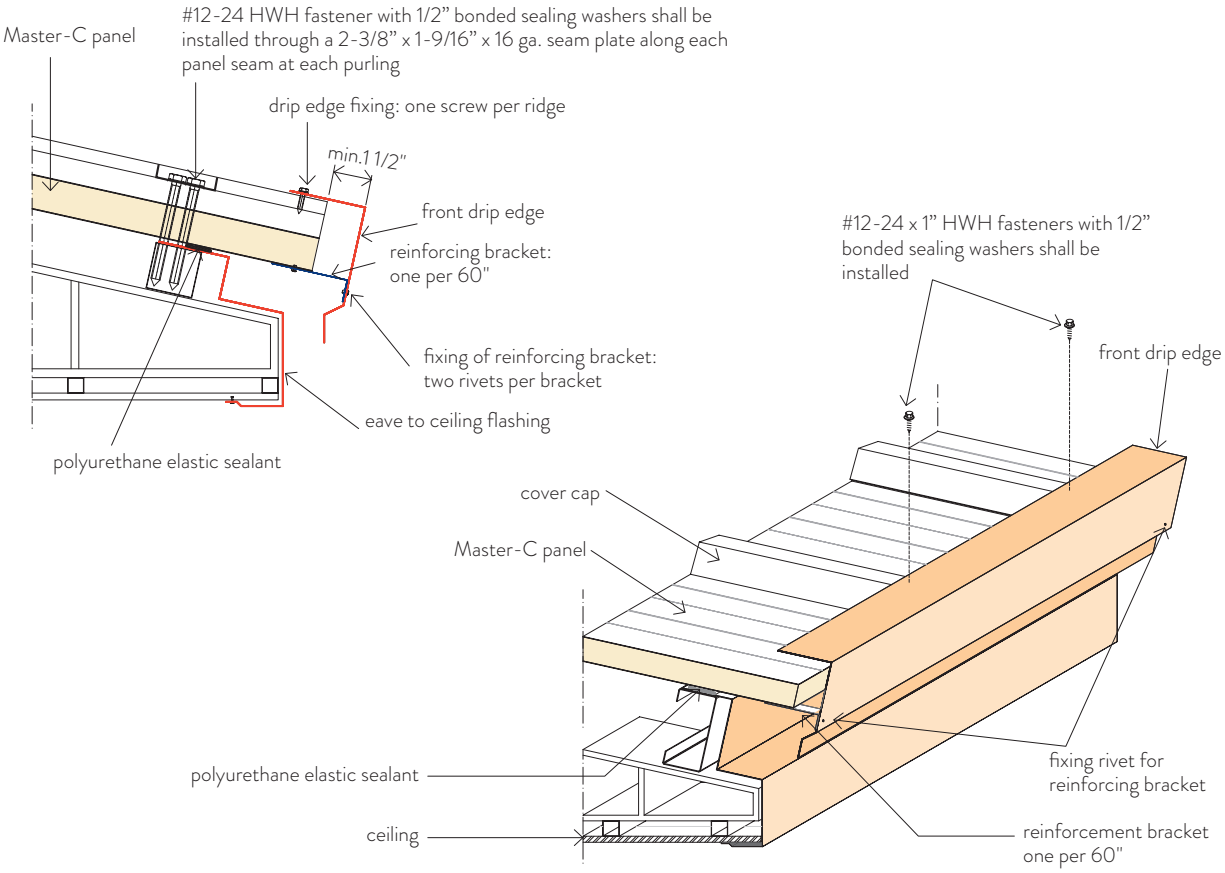




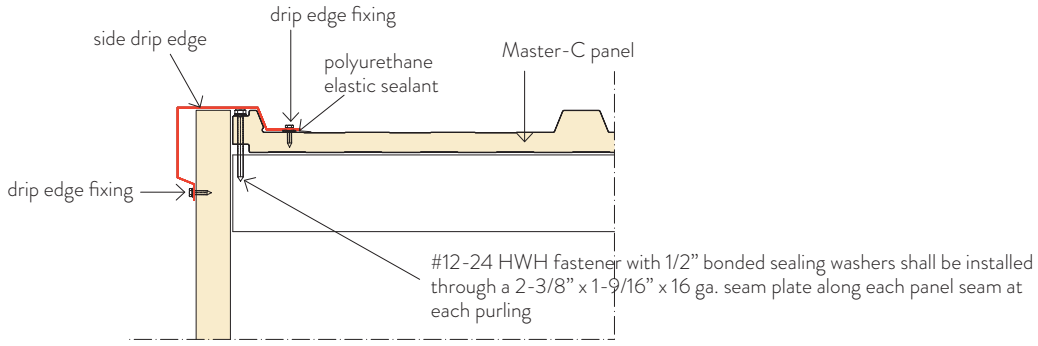
FRONT COVER:

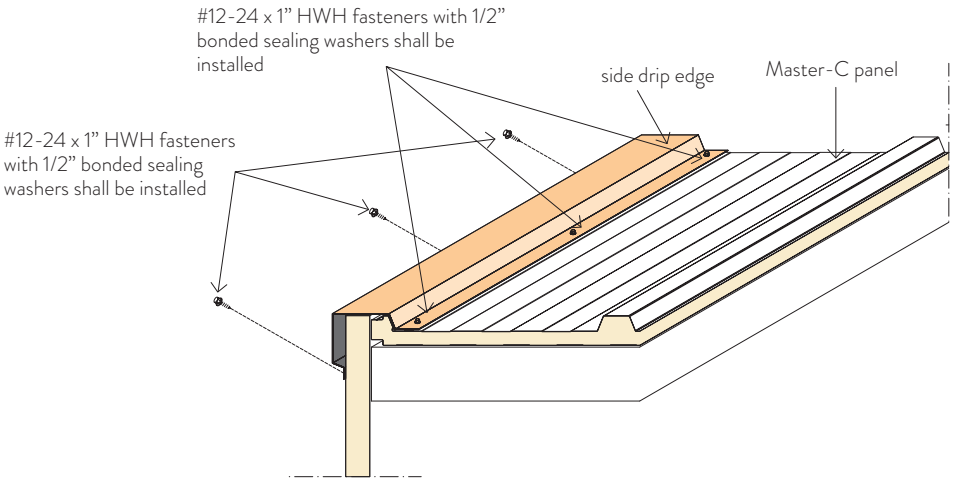


EAVE DRIP TO CEILING:



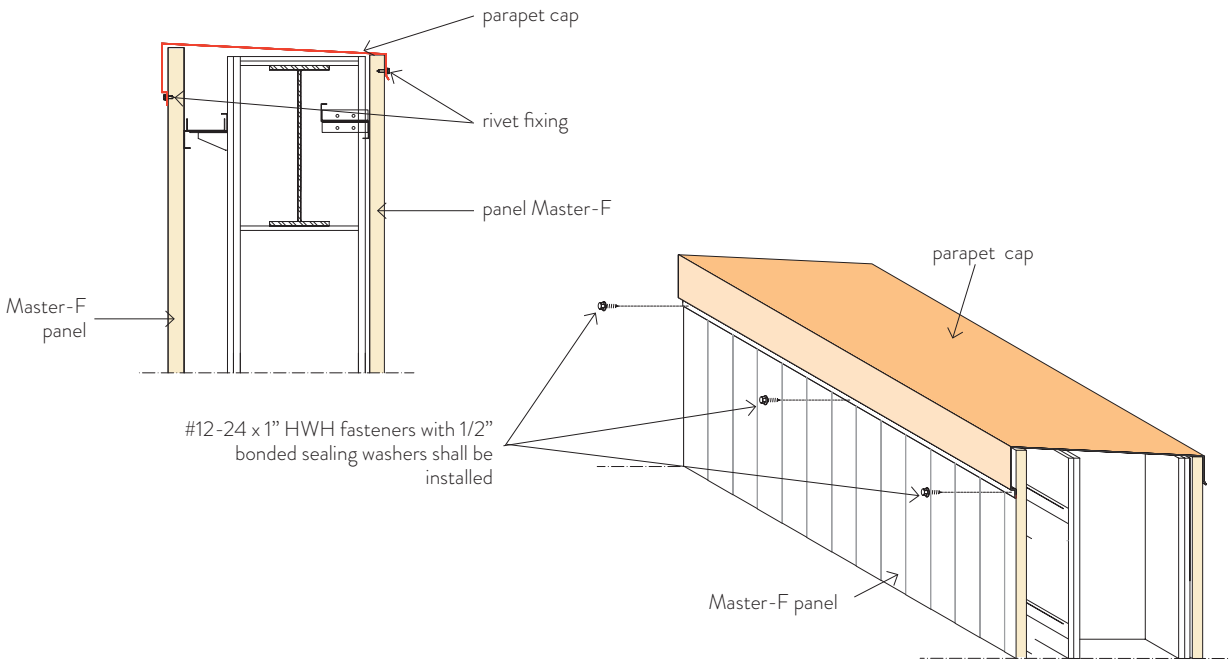
SIDE DRIP EDGE:



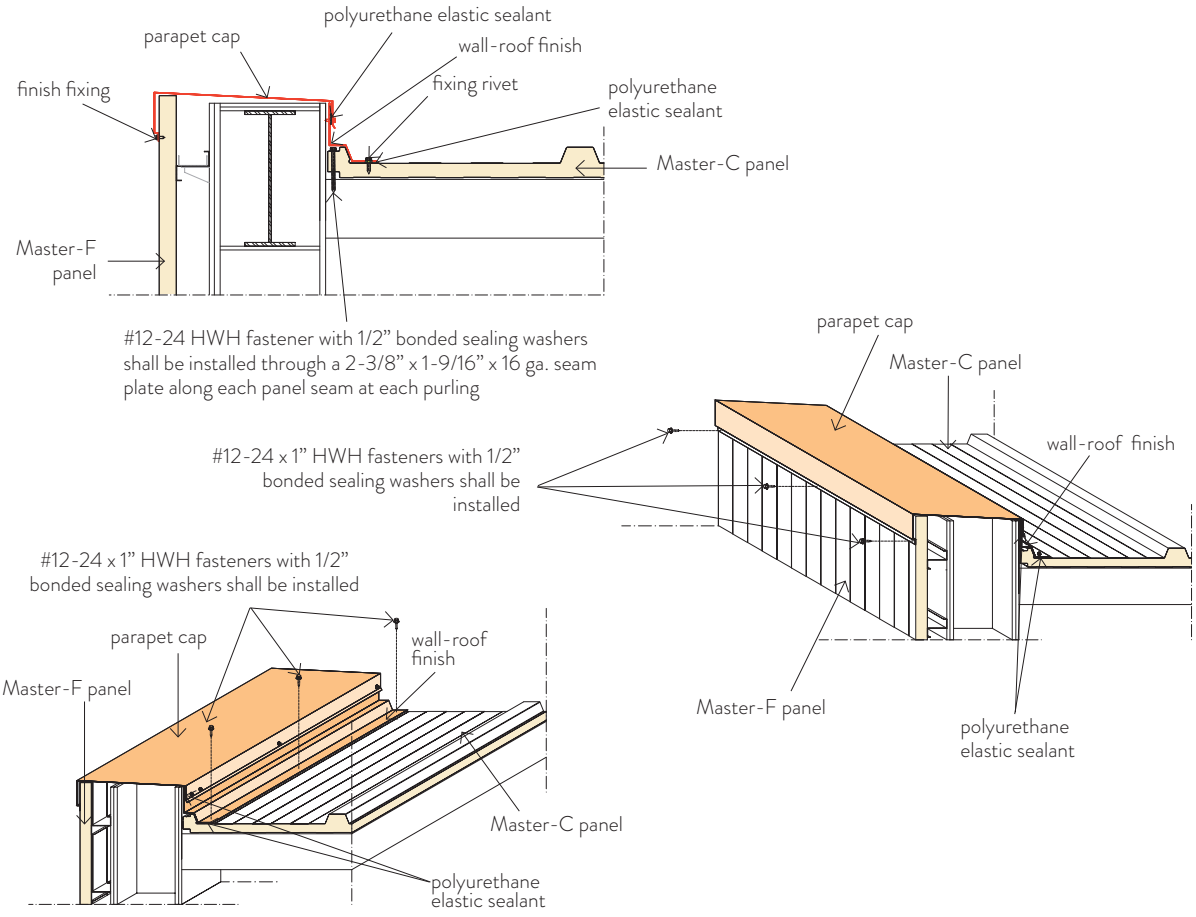


Technical assistance:

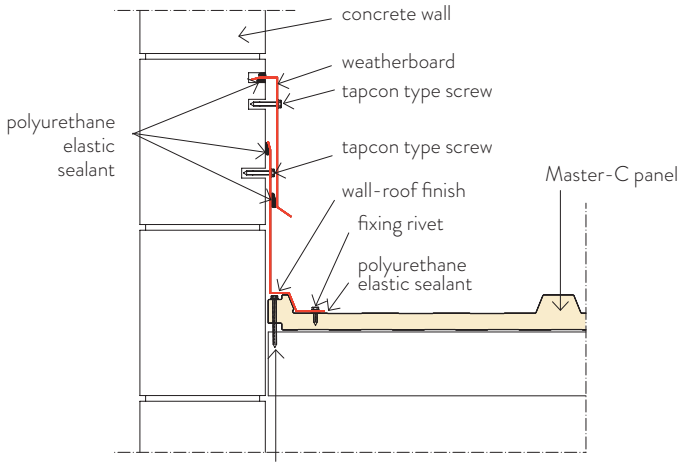
PARAPET CAP:



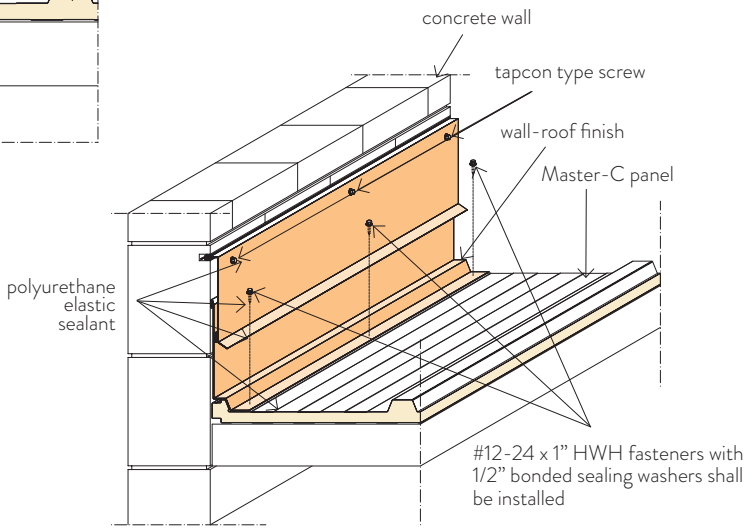
SIDE SLOPE



SIDE SLOPE TO WALL

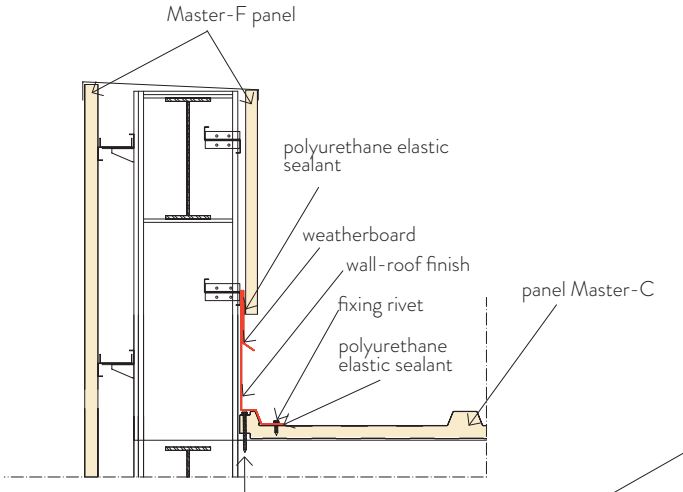


#12-24 HWH fastener with 1/2" bonded sealing washers shall be installed through a 2-3/8" x 1-9/16" x 16 ga. seam plate along each panel seam at each purling

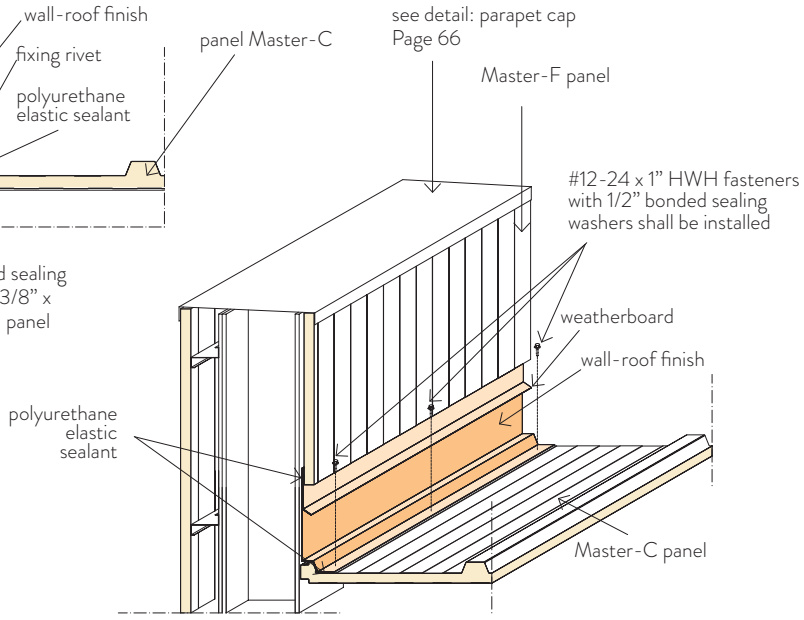


#12-24 x 1" HWH fasteners with 1/2" bonded sealing washers shall be installed

SIDE OF SLOPE TO WALL

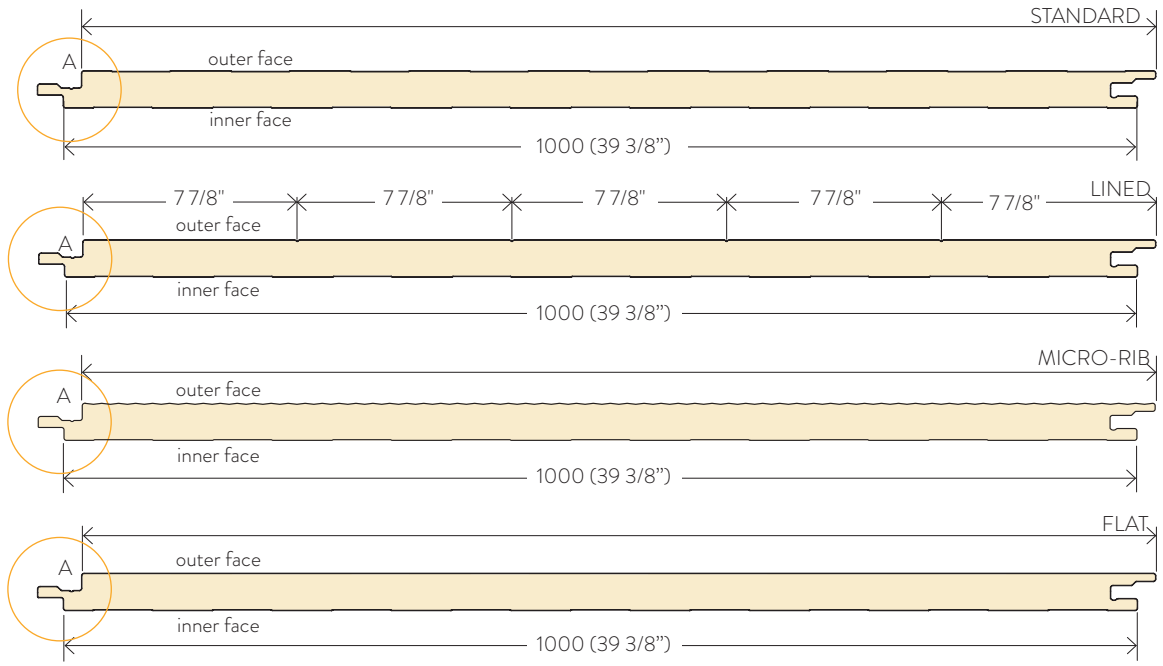


#12-24 HWH fastener with 1/2" bonded sealing washers shall be installed through a 2-3/8" x 1-9/16" x 16 ga. seam plate along each panel seam at each purling

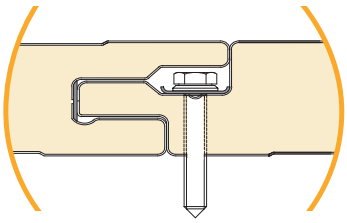


Technical assistance:

MASTER-F TYPE PROFILES AND JOINTS:

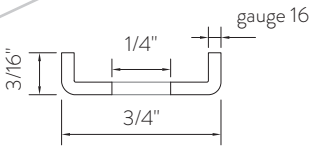


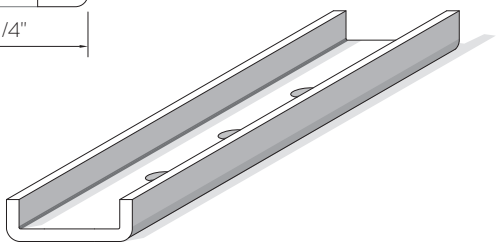
FASTENING DESIGN FD1:

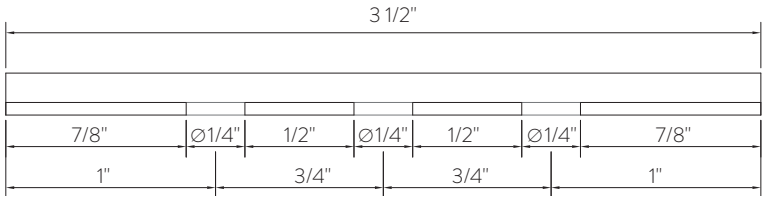


A Detail
(wall panel type joint)

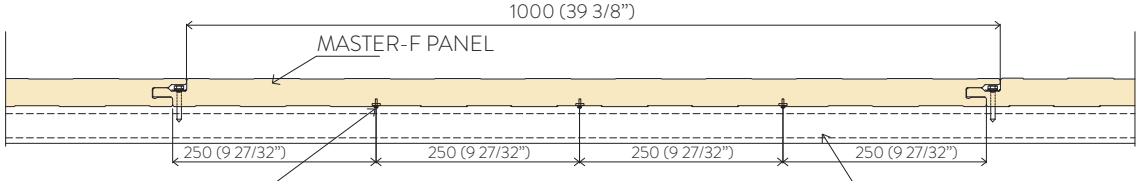
U clip details:







FASTENING DESIGN FD2:



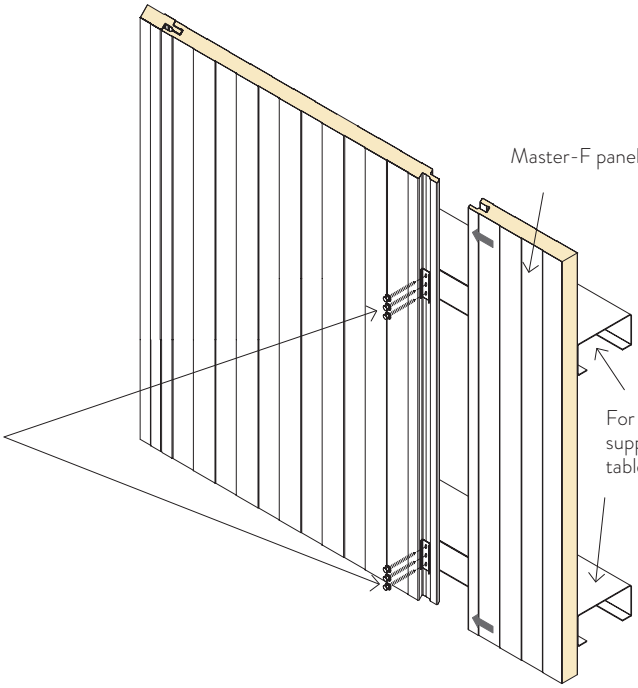
FAB-LOK

IN ADDITION TO THE FASTENING DESIGN, THE PANELS CAN BE INSTALLED WITH (3) FAB-LOK FASTENERS SPACED AT MAXIMUM 9,8" O.C. (250MM) FRON THE PANEL SIDELAP.
Elco's Fab-Lok ®FAS/FAC 10-4, 10-8 or 10-12
expansion fasteners to fasten the interior skin to support

MIN 16 GA. SUPPORTS BY OTHERS. (SEE LOAD SPAN TABLE FOR ALLOWABLE LOADS AND SPANS)

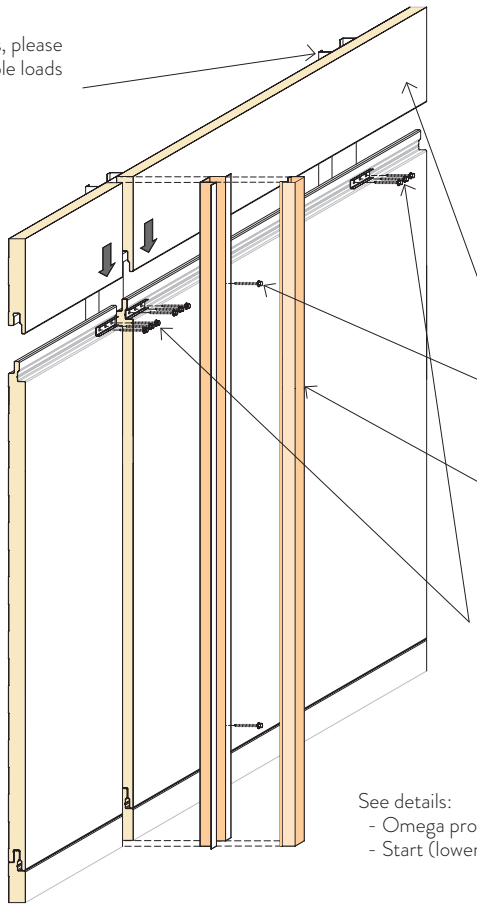
EXPLODED VERTICAL VIEW OF MASTER-F JOINT (FD1):

(2) Screws for 14 ga. support
(3) Screws for 16 ga. support
U-clip fastened to min. 16 ga. steel supports with (3) ¼"-14 type 3 self-drilling screws per clip or to min. 14 ga. steel supports with (2) ¼"-14 type 3 self-drilling screws per clip at all supports. for 12 ga. or thicker steel, #12-24 type 5 self-drilling screws may be used. in lieu of self-drilling screws, self-tapping screws may be used.



EXPLODED HORIZONTAL VIEW OF MASTER-F JOINT (FD1):

For the distance between supports, please consult the table of permissible loads

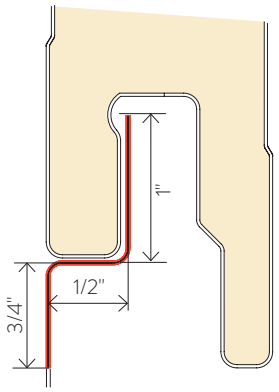


See details:
- Omega profile vertical joint on horizontal facing: Page 70
- Start (lower) of horizontal facing: Page 70

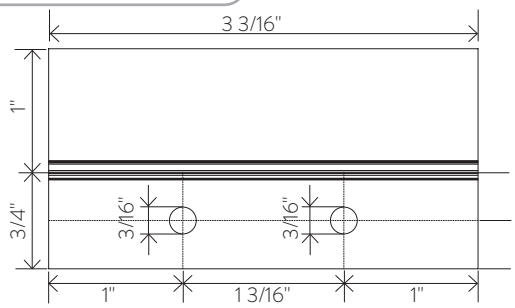
Technical assistance:

START (LOWER) OF HORIZONTAL FACING:

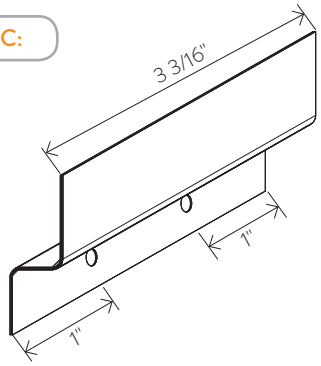
SECTION:



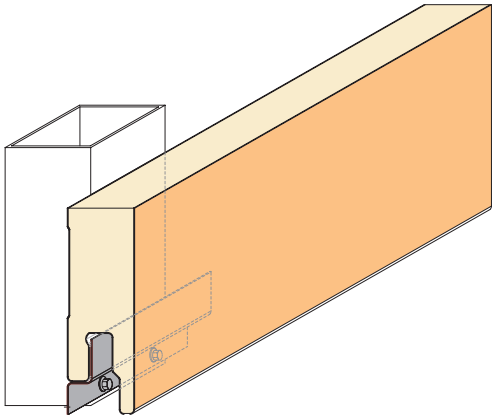
FRONT ELEVATION:



ISOMETRIC:

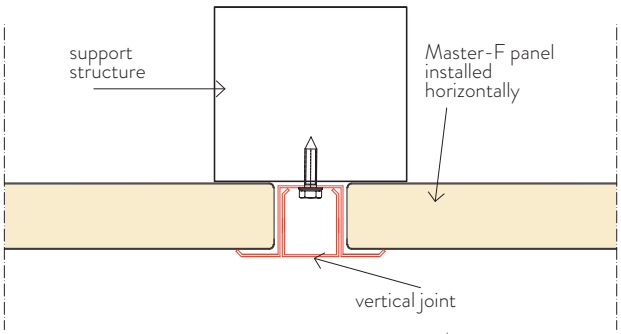


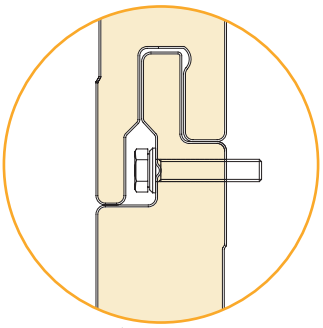
VIEW:



OMEGA PROFILE VERTICAL ON HORIZONTAL FACING:

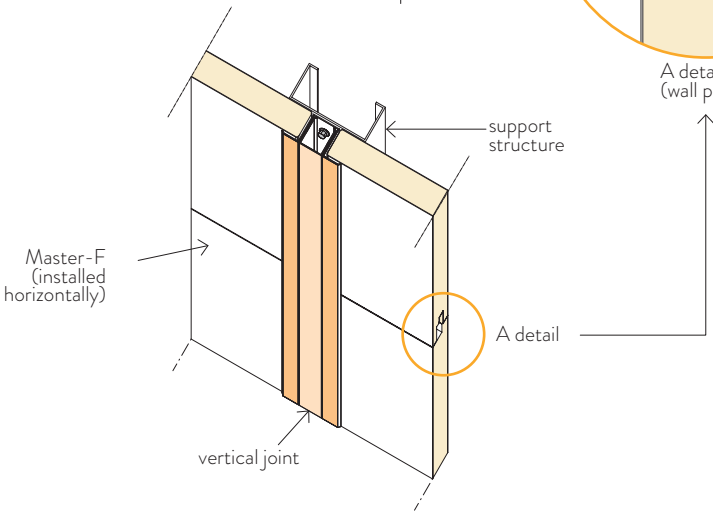
VIEW



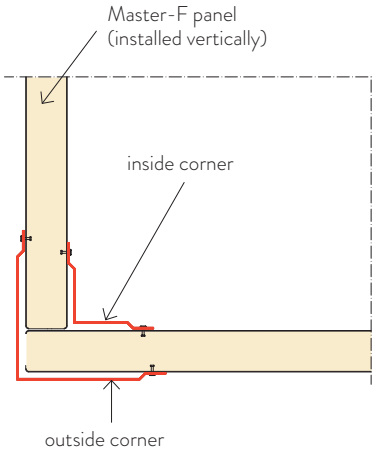


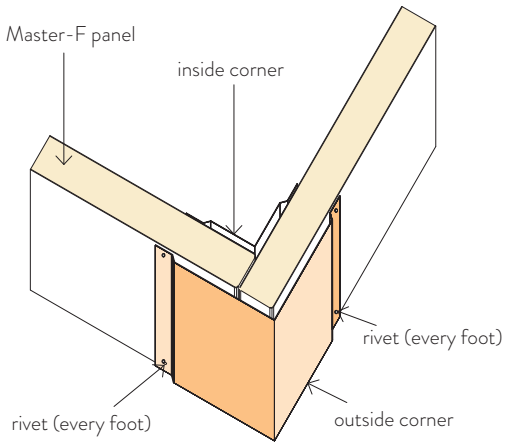
A detail
(wall panel type joint)

ISOMETRIC:

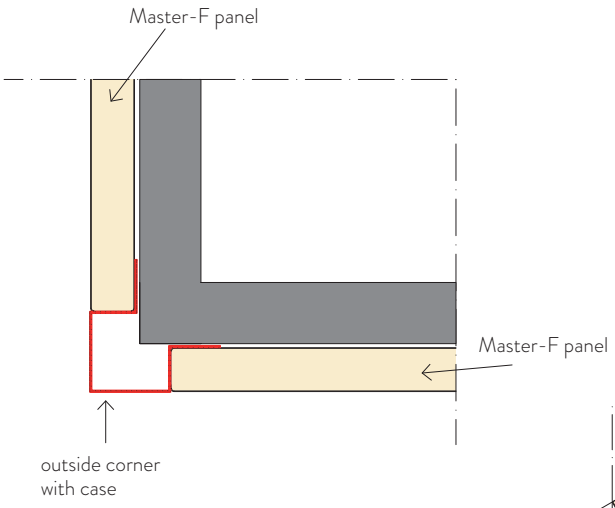


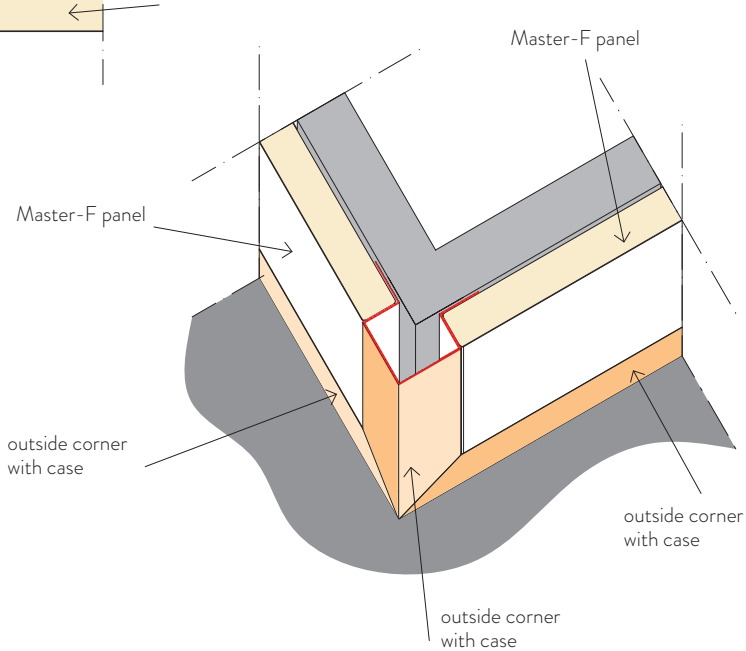
INNER/OUTER FACING CORNER:





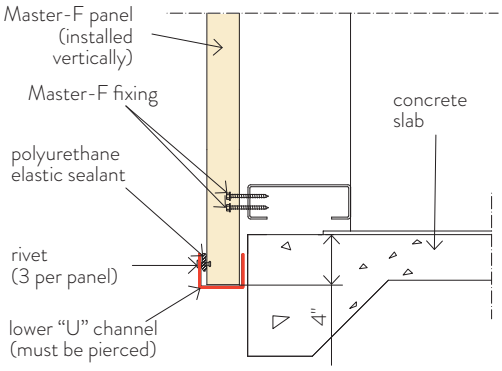
OUTER CORNER WALL PANEL WITH CASE:

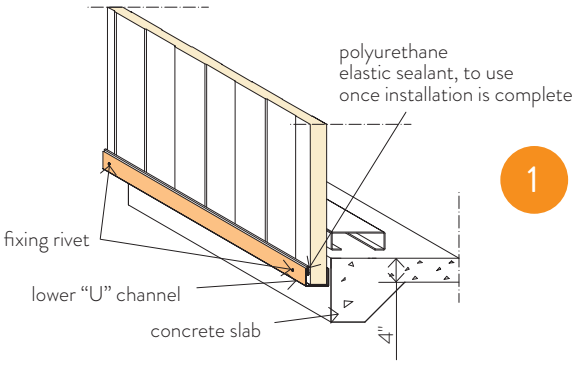


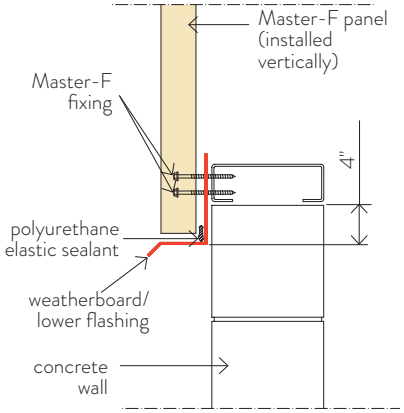


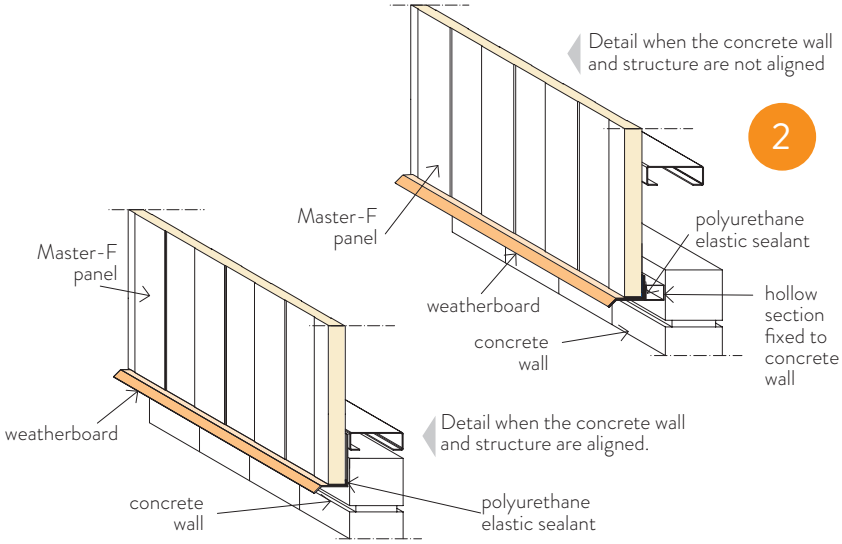
Technical assistance:

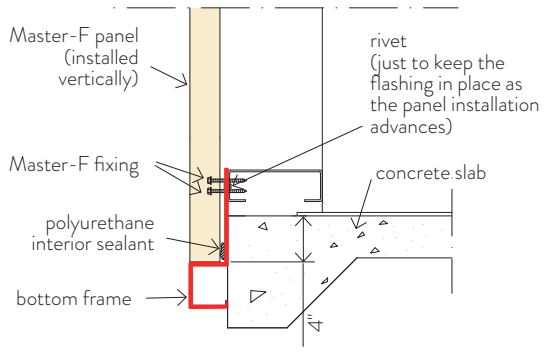
LOWER VERTICAL FACING:

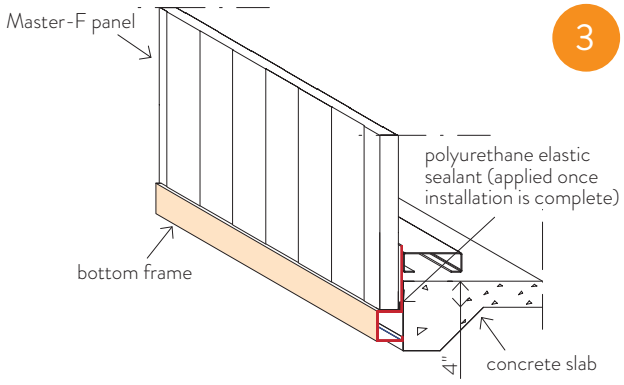


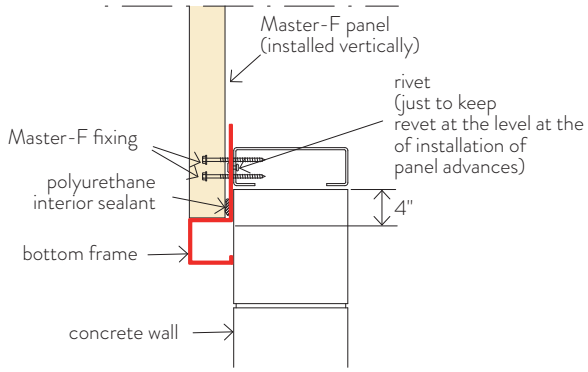


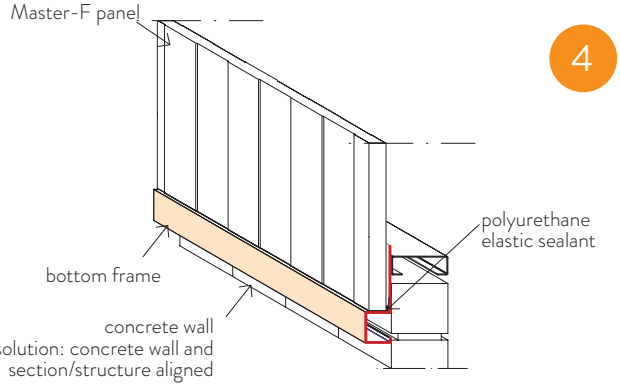




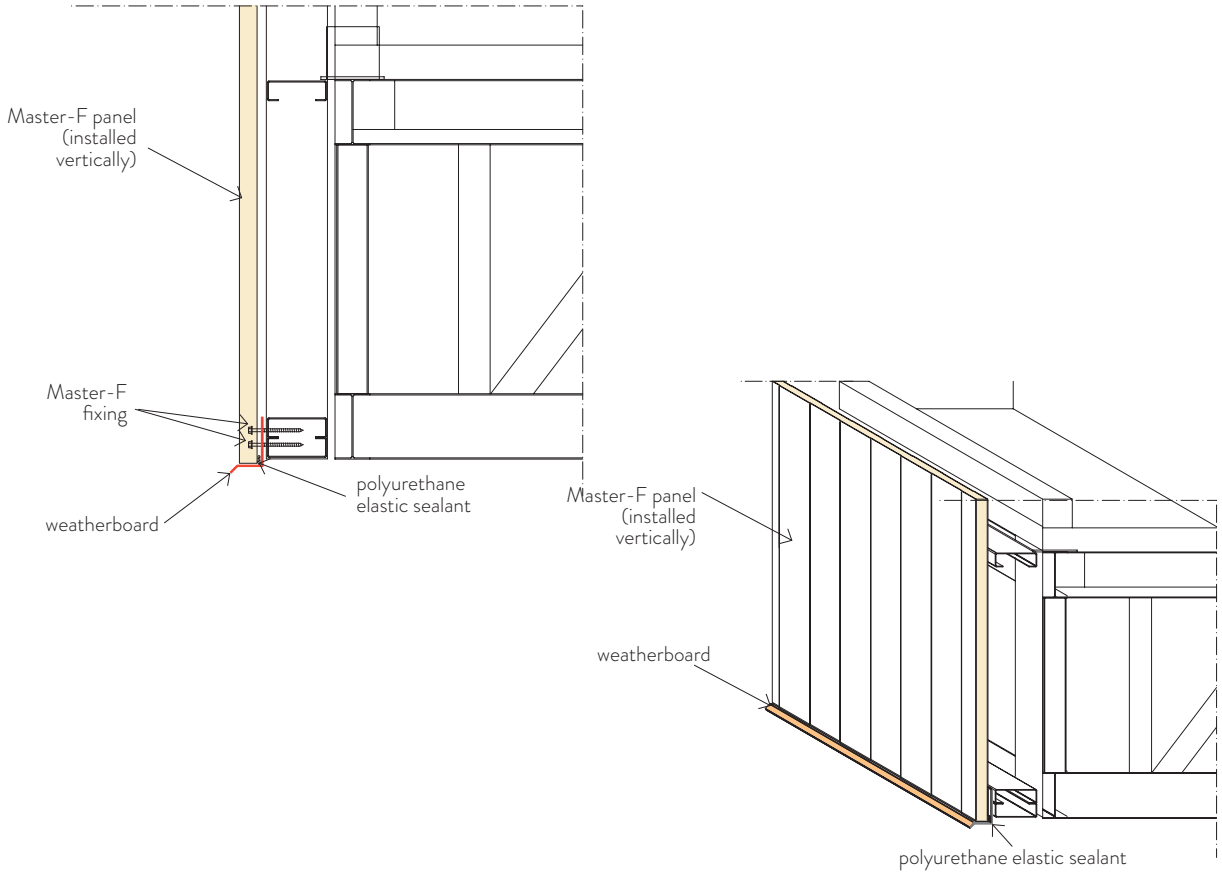




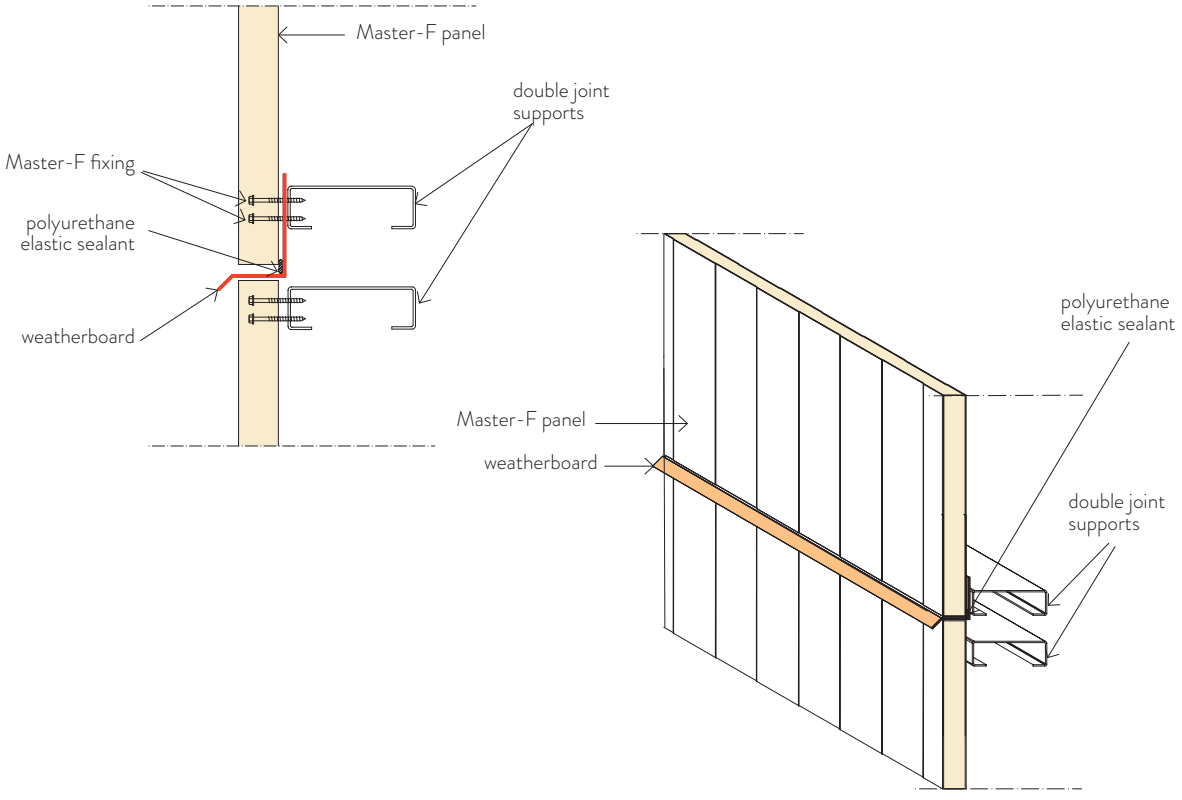




UPPER VERTICAL FACING:

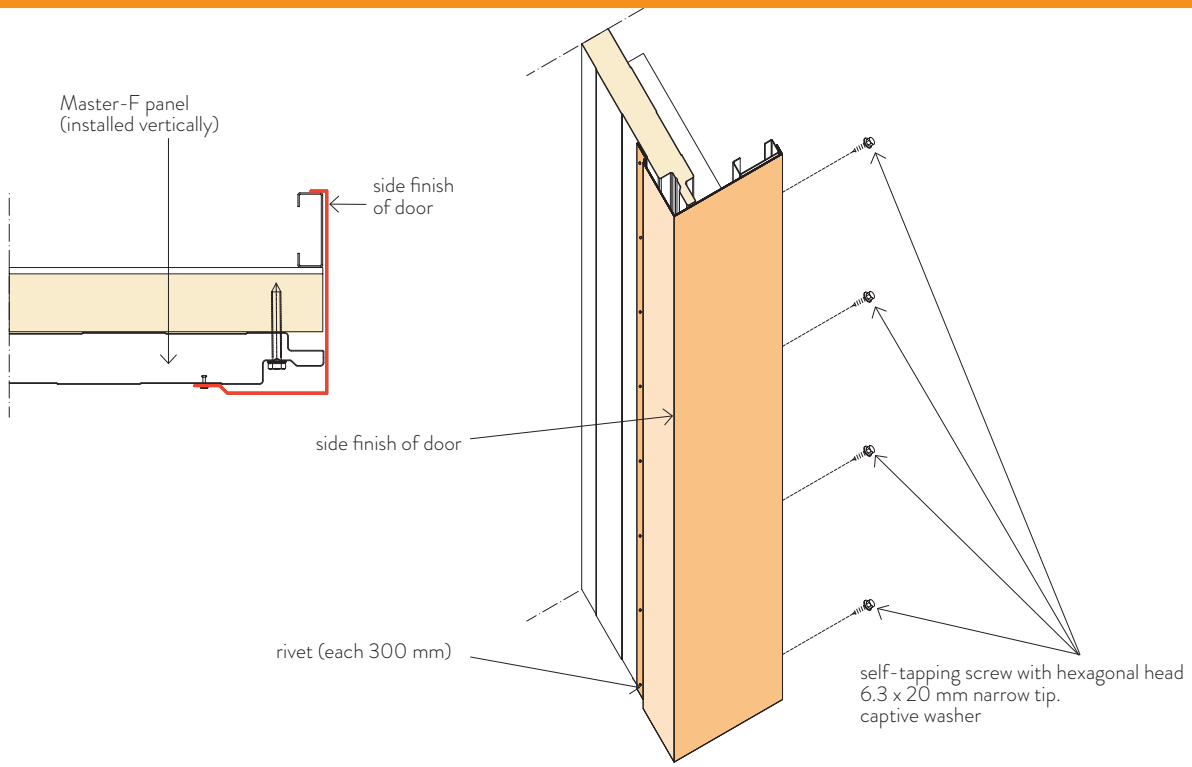


TRANSVERSE JOINT ON VERTICAL FACING:

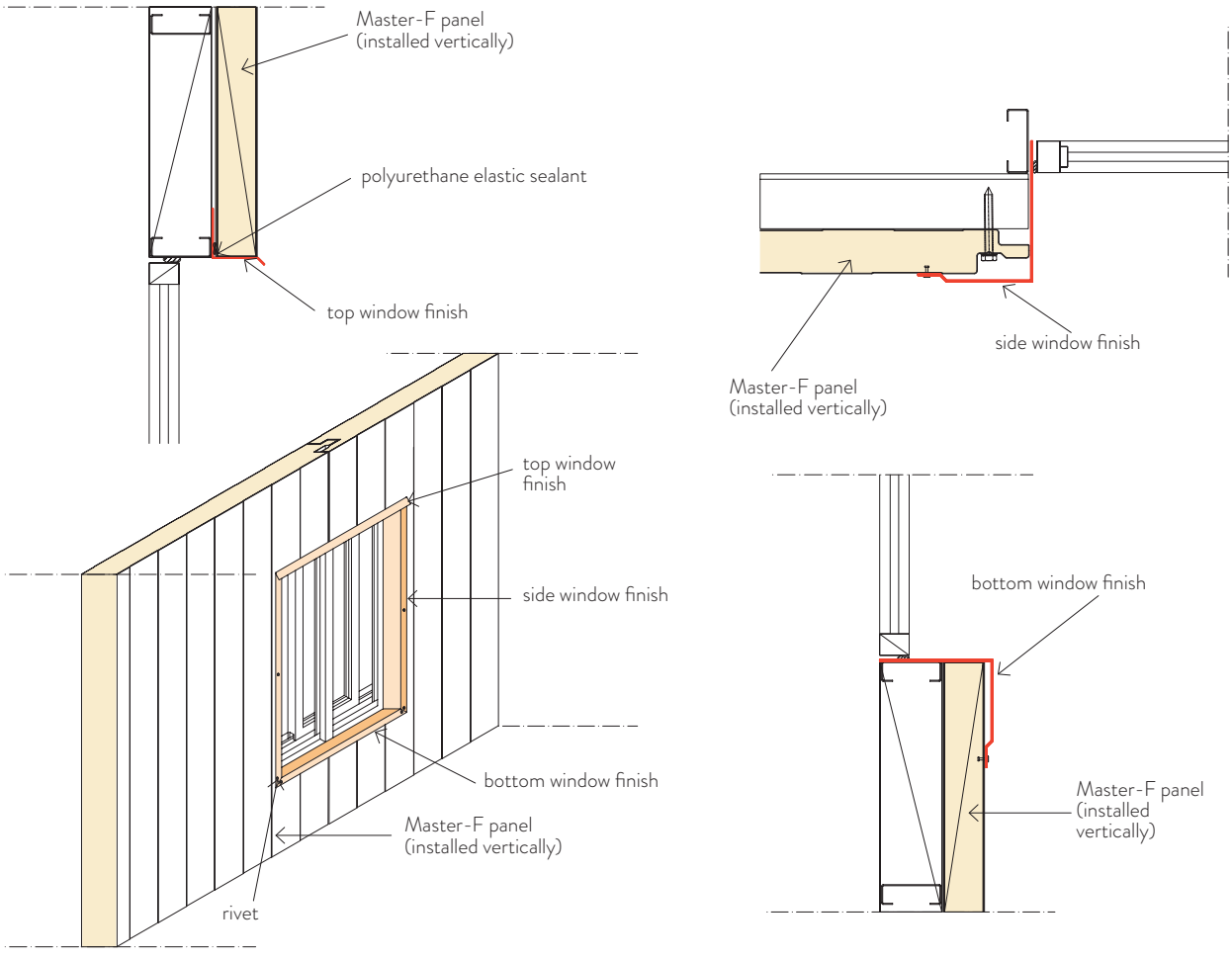


Technical assistance:

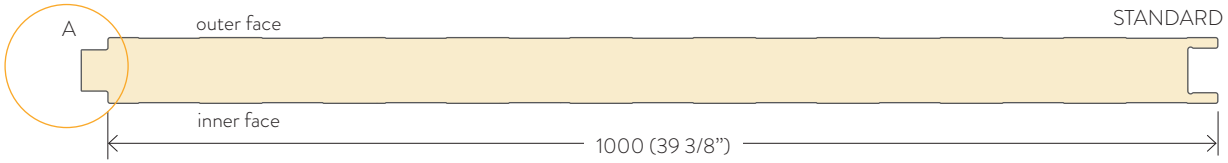
TECHNICAL ASSISTANCE:

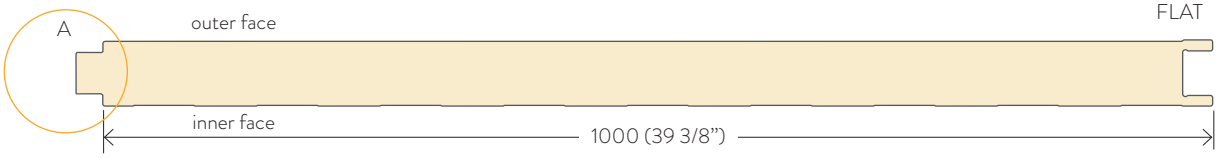


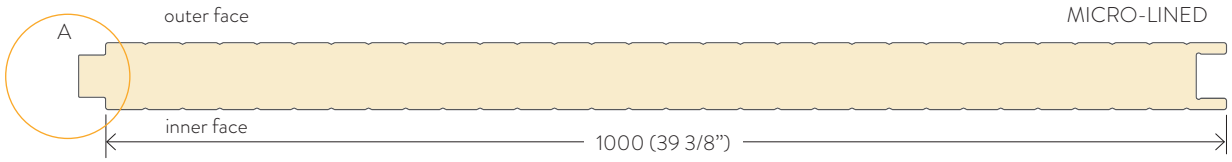
SOLUTION FOR WINDOWS:



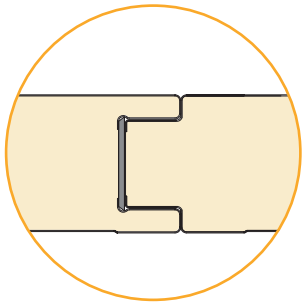
PROFILES AND TYPE MASTER-FRIGO/ JOINT:

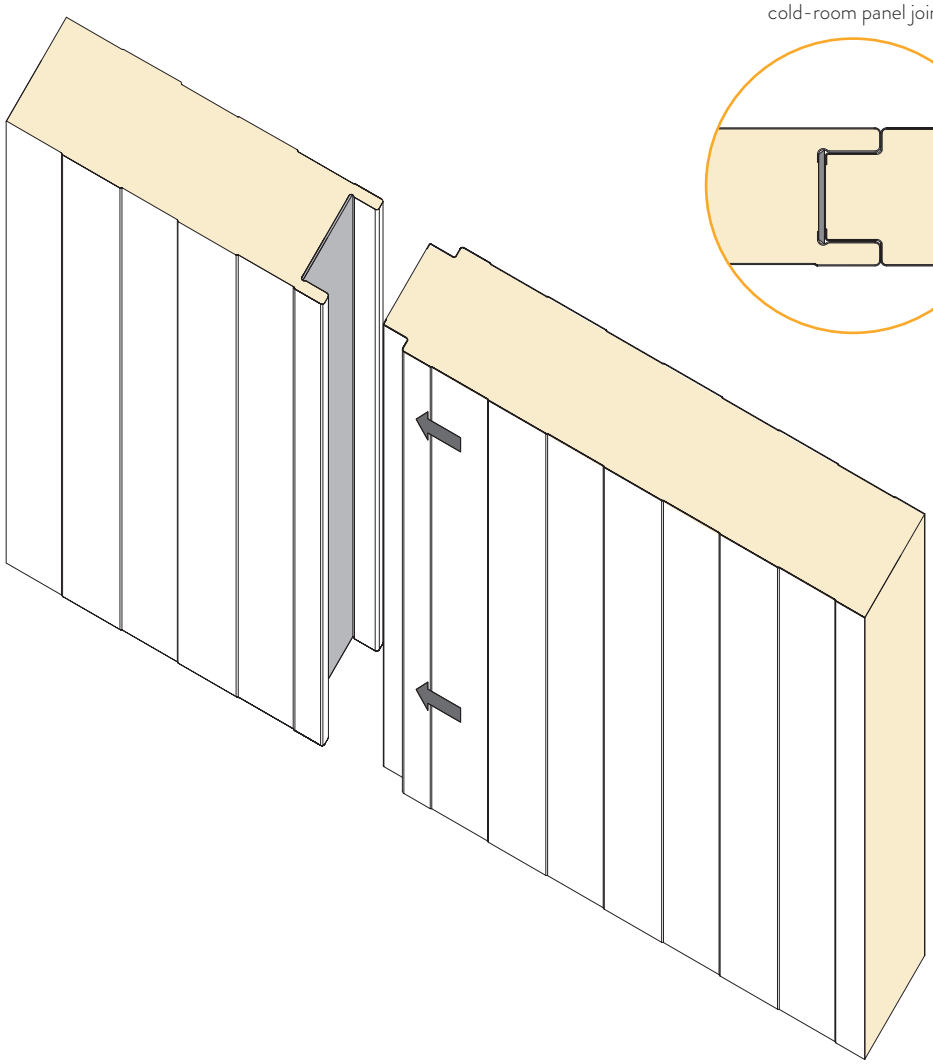






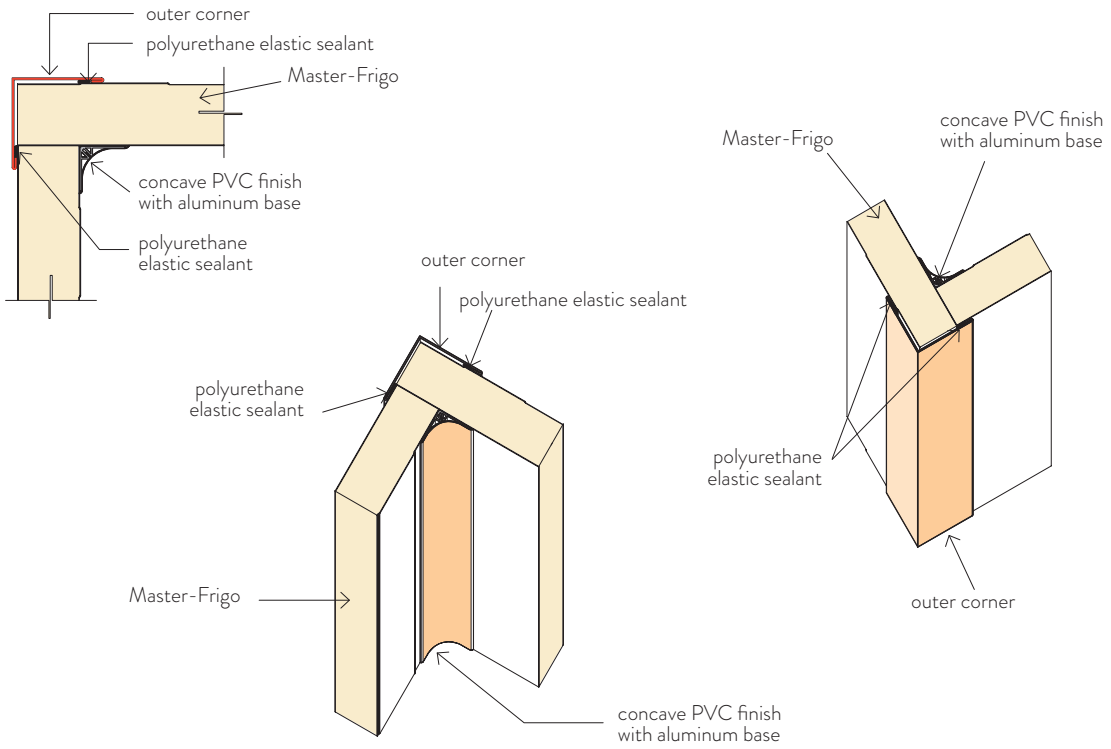
A DETAIL
cold-room panel joint



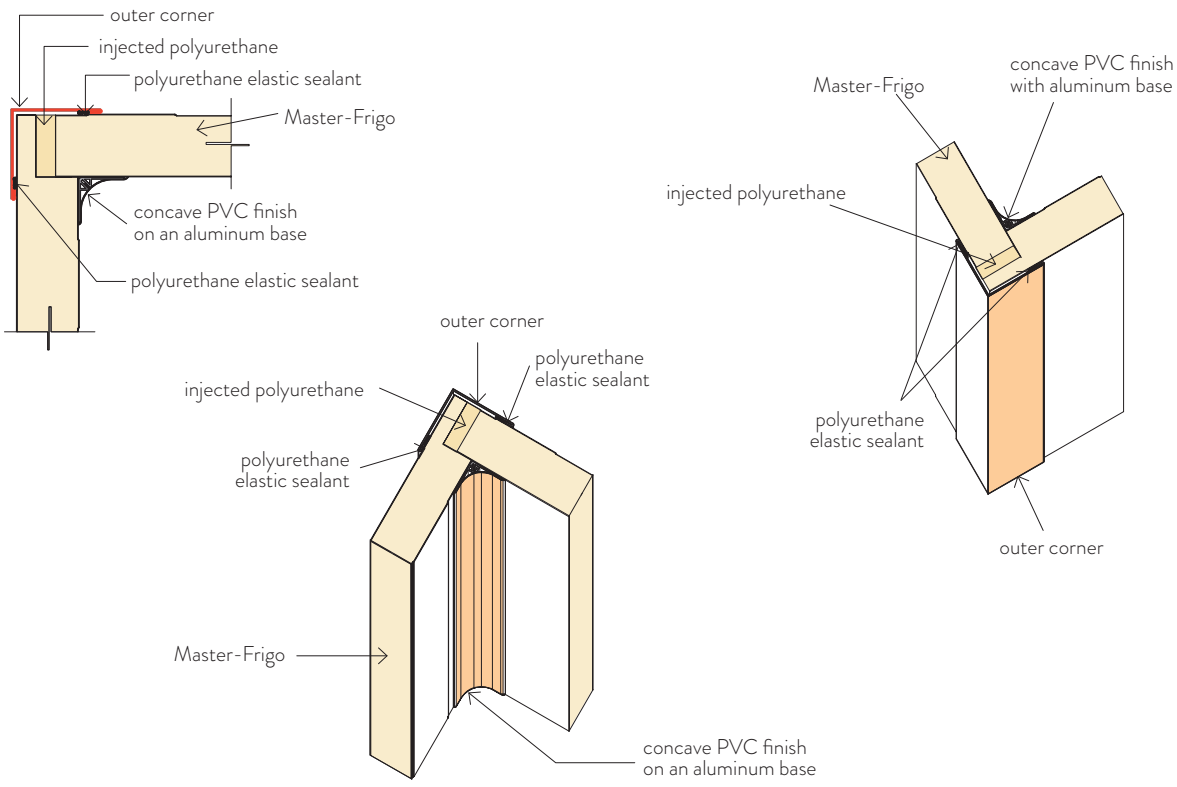


Technical assistance:

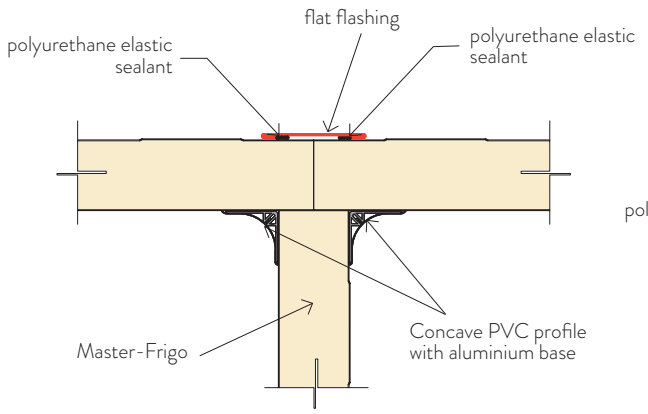
COLD ROOM CORNER JOINT (ROOM TEMPERATURE > 32 °F)

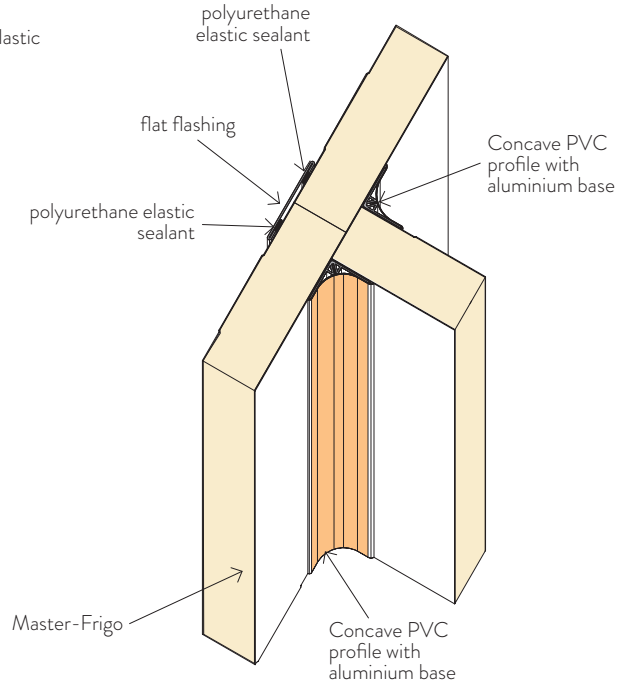


COLD ROOM CORNER JOINT (ROOM TEMPERATURE< 32 °F)

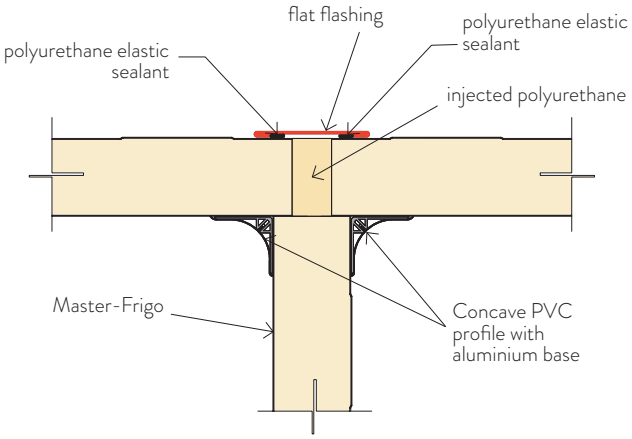


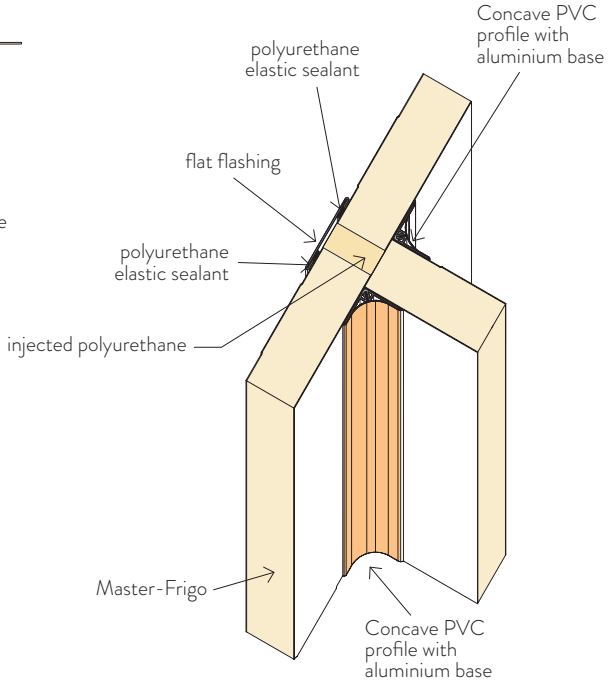
DOUBLE CORNER COLD ROOM JOINT: (ROOM TEMPERATURE > 32 °F)





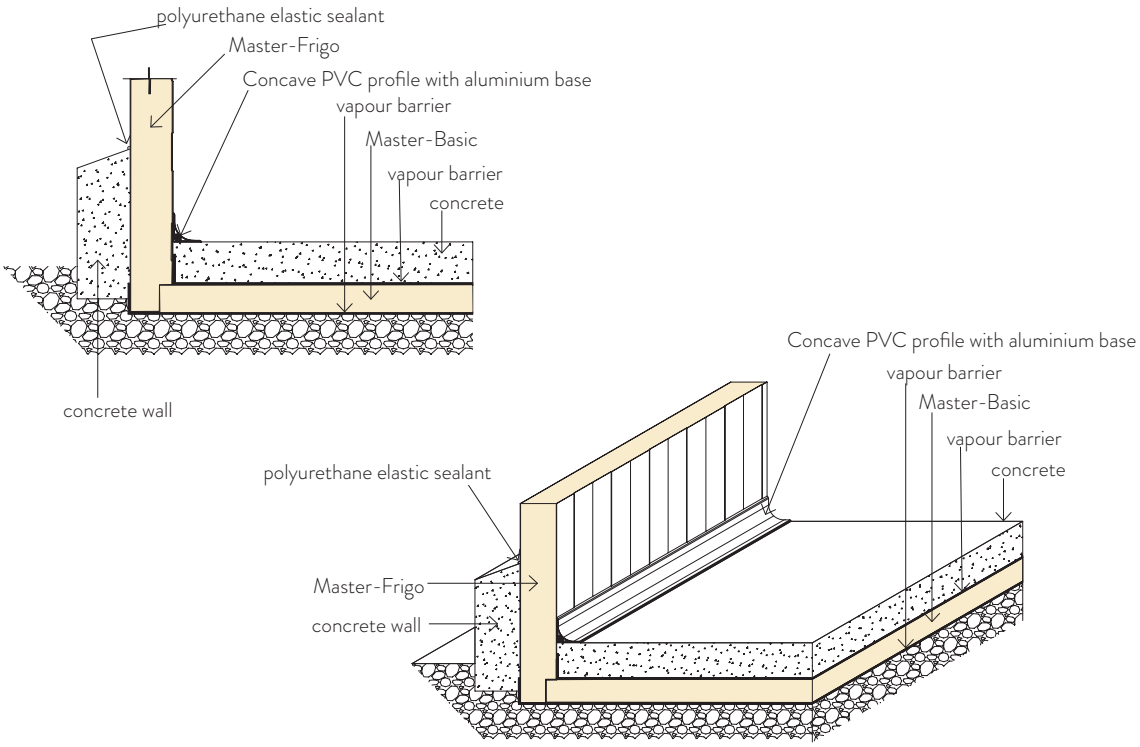
DOUBLE CORNER COLD ROOM JOINT: (ROOM TEMPERATURE< 32 °F)



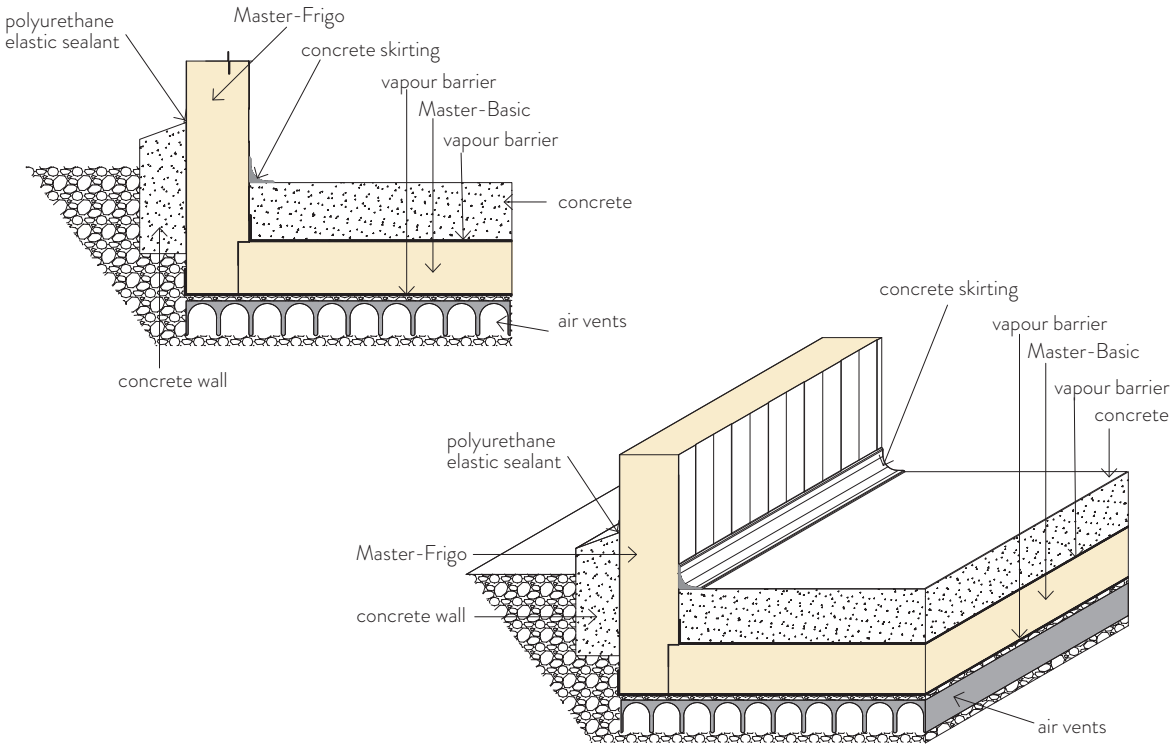


Technical assistance:

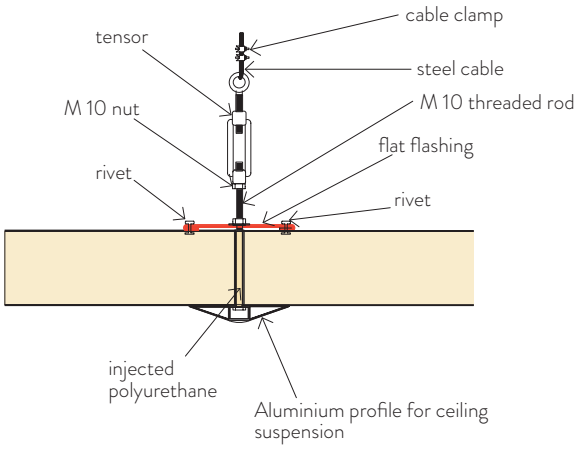
COLD ROOM WALL-FLOOR JOINT: (ROOM TEMPERATURE > 32 °F)

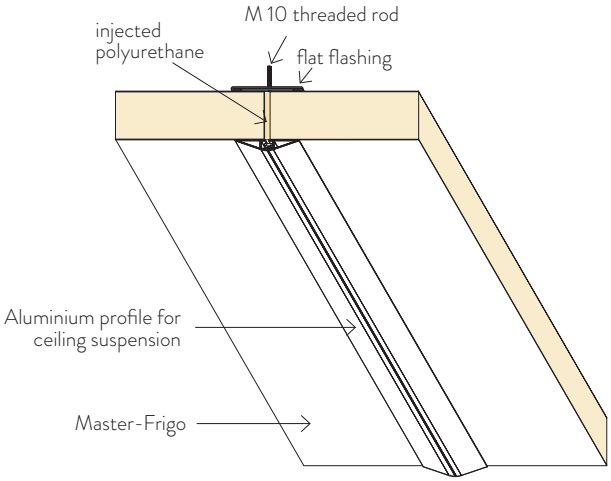


COLD ROOM WALL-FLOOR JOINT: (ROOM TEMPERATURE< 32 °F)

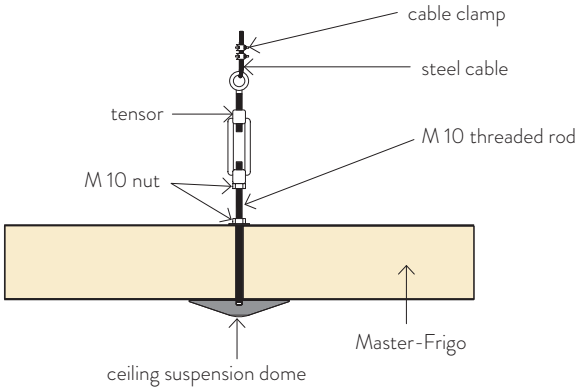


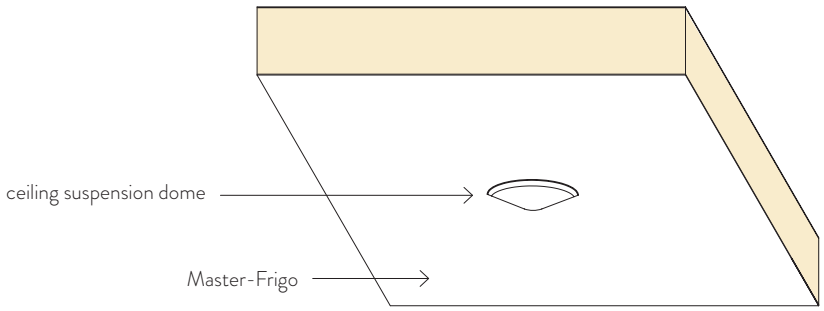
COLD-ROOM CEILING LONGITUDINAL SUSPENSION:





COLD ROOM CEILING POINT SUSPENSION:





Fitting acessories:

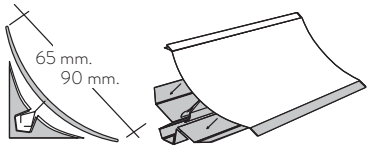
COLD ROOM ACCESSORIES:

Application:

Interior finishes for ceilings and walls for projects where a fungus- and bacteria-free hygienic environment is required or specified.

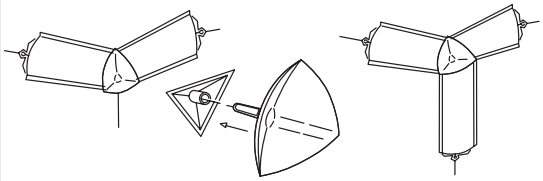
General specifications:

Non-toxic
High standards of hygiene-
Non-porous
Highly elastic
Unaffected by fats,
excretions or blood
Recyclable material
Resistant to chemical
products, even alkalines
Good behavior
at low temperature.
Easy installation
No drying time
No need for painting
Pressure washable
Waterproof
Easy cleaning
Non-stick surface
Impact resistant
Non corrosive
Light

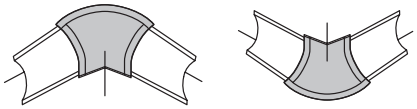


available in 3,000 mm (118") lengths

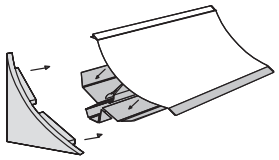
Concave profile 90mm (3 9/16").
Concave profile 65mm (2 9/16").
Aluminum base
Narrow aluminum base
PVC base



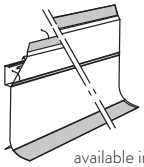
3-way PVC corner
2-way PVC corner



Corner angle joint

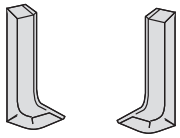


End cover

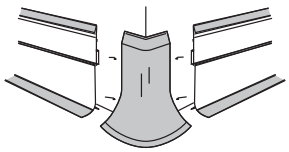


available in 3,000 mm (118") lengths

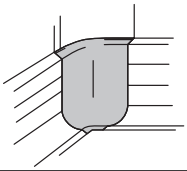
PVC skirting



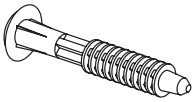
Skirting terminal
(Right and left)



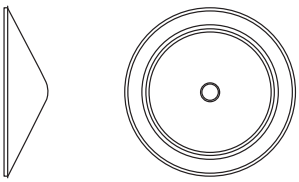
PVC Skirting corner-piece



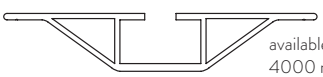
PVC skirting corner-piece



Plastic plug



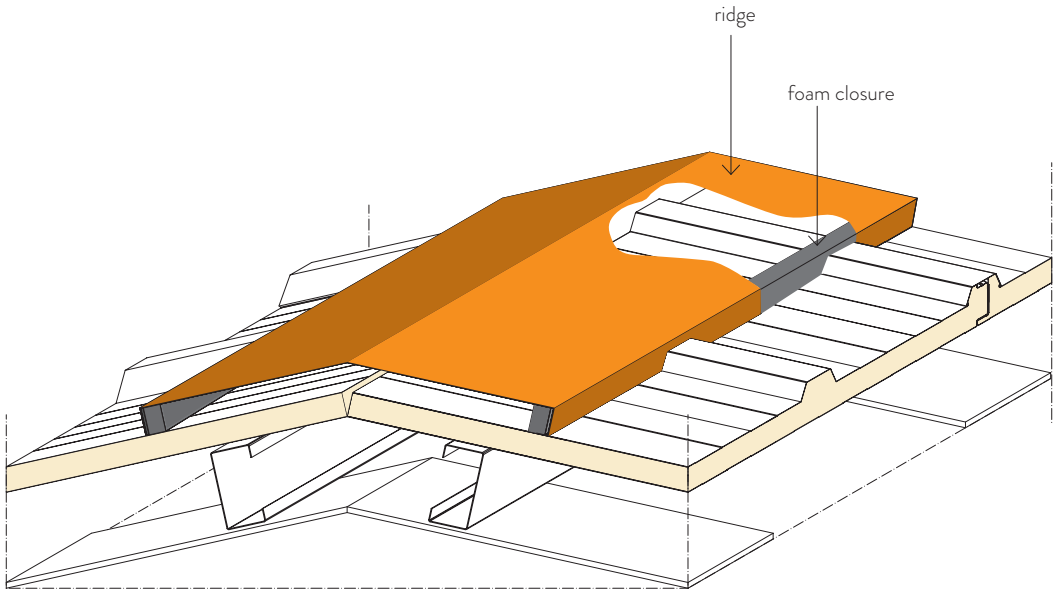
Ceiling suspension dome



available in pieces of
4000 mm (157 1/2") in length

Aluminium profile for ceiling suspension
(price includes one M10 nut per 3 feet)

FOAM CLOSURE FOR 3G PROFILES



PROPERTIES	CHARACTERISTICS	STANDARD
Material	**cross-linked polythene**	
Apparent density	30+ -3kg/m^3	ISO 845
Ultimate elongation	76 min. %	ISO 1926
Tensile strength	127 min. Kpa	ISO 1926
Yield strength 10%	25+ -6 Kpa	ISO 844
Yield strength 25%	41+ -6 Kpa	ISO 844
Yield strength 50%	98+ -8 Kpa	ISO 844
Permanent compression 25% 22 h., 23 °C at 1/2 hour	17 max. %	ISO 1856-B
Permanent compression 25% 22 h. 23 °C a las 24 horas	8 max. %	ISO 1856-B
Water absorption at 28 days	1 max. %	DIN 53428
Hardness	38 min. Shore°°	
Operating temperature	-80 a 100 °C	INTERNAL
Cell size	0,3 mm máx.	INTERNAL
Reaction to Fire	100 máx. mm./min>10 mm.	FMVSS Nr 302
Material	**Double-sided adhesive mesh**	**-------**
Support	Multidirectional polyester mesh	-------
Grams of adhesive	80 grams /m^2	-------
Adhesive strength Afera 4001	N/25 mm. 16 +- 1%	-------
Temperature resistance	-20 a 100 °C	-------

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masterpanel@magon.es

MASTER PANEL

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