CASE #PL2019-46

# Transmittal

Weis Builders, Inc.
7645 Lyndale Avenue South
Minneapolis, MN 55423

Building Relationships Since 1939

Project Number: 191567
Date: 4/16/2020

Project Name: The District
Submittal No: 074213.23-001

To: Elness Swenson Graham Architects, Inc.
500 Washington Ave. South
Minneapolis, MN 55415
Ref: Metal Panels
Fax: 612-3395382

Phone:
Sent Via: Submittal Exchange

Attn: Nick Vreeland
Date Due: 4/30/2020

Submitted By: Scott Nelson

| Spec | Copies | Description | Action |
|---|---|---|---|
| 074213.23 | 1 | Product Data, Design Data, & Test Reports | For Review and Approval |

Remarks:
Please find the attached metal composite material wall panels product data/design data/test data, for your review and approval.

☒ NO EXCEPTIONS TAKEN
☐ MAKE CORRECTIONS NOTED
☐ REVISE AND RESUBMIT
☐ REJECTED

REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT AND GENERAL COMPLIANCE WITH INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. ANY ACTION SHOWN IS SUBJECT TO REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. IT IS THE GENERAL CONTRACTOR'S RESPONSIBILITY TO VERIFY AND CORRELATE ALL DIMENSIONS AND CONDITIONS AT THE JOBSITE, FABRICATIONS, METHODS, CONSTRUCTION TECHNIQUES, AND CONFORMATION AND SATISFACTORY PERFORMANCE OF ALL CONTRACTORS AND SUBCONTRACTORS.

**ELNESS SWENSON GRAHAM ARCHITECTS INC.**

BY: *Nick Vreeland, AIA* DATE: April 24, 2020

CC: Project Superintendents

Signed: Scott Nelson

Weis Builders, Inc.
SUBMITTAL\SHOP DRAWING

☐ Reviewed ☒ Reviewed As Noted ☐ Revise and Resubmit

4/16/2020

This review is only for general conformance with the contract documents. Subcontractor or supplier is responsible for specific compliance with plans and specifications.

By: Scott Nelson

CASE #PL2019-40

SIDING 5C, 5E, AND 5F

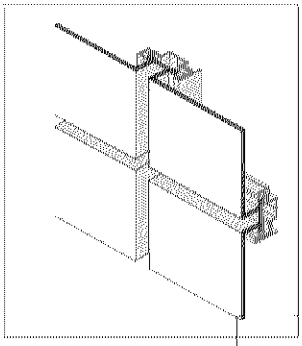
# ALPOLIC

METAL COMPOSITE MATERIALS

MITSUBISHI CHEMICAL COMPOSITES AMERICA, INC.

## fr architectural – solid

ALPOLIC®/fr architectural Solid color aluminum composite materials are manufactured with a mineral filled fire resistant core and a 2-coat fluorocarbon paint finish. Distinctive classic of the industry, they are stocked for immediate shipment.



### CONSTRUCTION INFORMATION

PROJECT: **DISTRICT APARTMENTS**

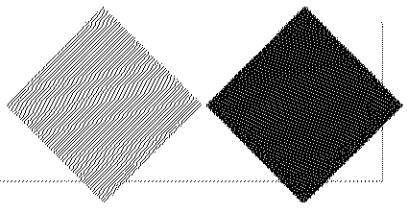
LOCATION: **BLOOMINGTON, MN**

ARCHITECT: **ELNESS SWENSON GRAHAM ARCHITECTS INC.**

PRODUCT: **ALPOLIC/FR**

### GENERAL INFORMATION

Picture your next project in attractive, clean colors and designs that only our lightweight aluminum composite material (ACM) panels can achieve. They are stocked in two widths – 50 and 62 inches; and two lengths – 146 and 196 inches. These 4mm-thick panels are manufactured to architectural standards with an advanced fire resistant core.



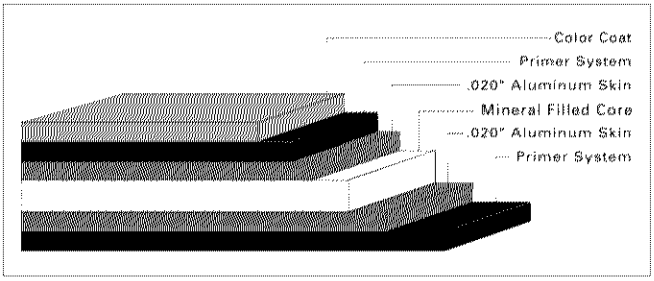
| *BONE WHITE* | *MIST WHITE* | *OYSTER* | *ALUMINUM GREY* | *JBR BRONZE* |
|---|---|---|---|---|
| *4-4BNT-G30* | *4-4MST-G30* | *4-4CRT-G30* | *4-4AGT-G30* | *4-4JBR-G30* |

# ALPOLIC/fr solid

INTERIOR AND EXTERIOR SURFACING
INTERIOR AND EXTERIOR SIGNAGE

## SURFACE TREATMENT

ALPOLIC®/fr architectural Solid color panels are stocked with a FEVE LUMIFLON™ finish, a fluorocarbon paint system that features excellent durability and weathering for architectural needs. A PVDF, Kynar finish is available as a custom request. Available stock architectural solid colors include Bone White, Mist White, Oyster, Aluminum Grey, BGY Grey, and JBR Bronze.




## STANDARD PANEL SIZE

Standard stock widths are 50" (1270mm) and 62" (1575mm) and lengths of 146" (3708mm) and 196" (4978mm). Panels are stocked in 4mm thickness. Standard crate is 30 pieces. Custom lengths and thickness available. Please contact ALPOLIC Customer Service for current available stock and additional information.

## FINISH TOLERANCE

| | |
|---|---|
| Color: | DE 1.0 max from standard |
| Gloss: | Nominal +/-10 units |

## PRODUCT TOLERANCE

| | |
|---|---|
| Width: | ± 0.08" (2mm) |
| Length: | ± 0.16" (4mm) |
| Thickness: | 4mm: ± 0.008" (0.2mm) |
| | 6mm: ± 0.012" (0.3mm) |
| Bow: | maximum 0.5% of length and/or width |
| Squareness: | maximum 0.2" (5mm) |
| Peel Strength: | >22 in lb/in (ASTM D1781) |

ALPOLIC material is trimmed and squared with cut edges to offer the best panel edge conditions in the industry.

## FIRE PERFORMANCE

Fire resistant ALPOLIC/fr architectural Solid finish panels with a mineral filled core have been tested by independent testing laboratories using nationally recognized tests.

This material meets all requirements of the International Building Code for non-combustible construction.

IBC Listed

Please visit www.alpolic-northamerica.com or call technical support for complete report listings and additional information.

## WARRANTY

| | |
|---|---|
| Standard panel warranty: | 10 Year |
| Finish warranty: | 30 Year* |

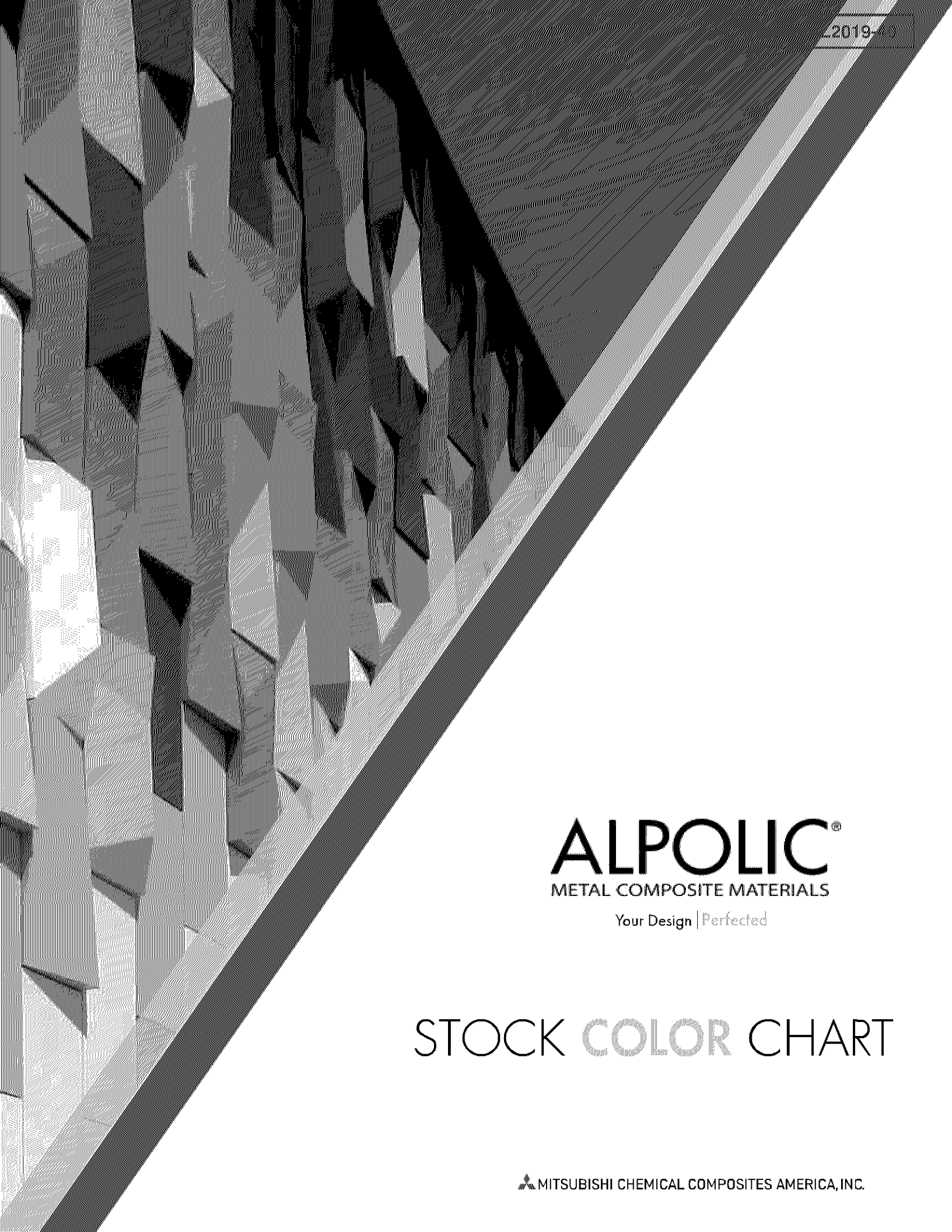
Call ALPOLIC® Customer Service for exclusions and warranty details. *30 year warranty only applies to standard architectural colors.

## PRODUCT NOTES

- Panels should be stored flat in a dry, indoor environment.
- Fabricate panels at temperatures above 55°F.
- Protective film should be removed from panels soon after installation.
- Please refer to ALPOLIC/fr Painted ACM Fabrication Manual for routing and fabrication recommendations.
- Crating fees apply to orders for less than standard piece crate.

## FOR TECHNICAL INFORMATION, PLEASE CALL 1.800.422.7270

U.S. HEADQUARTERS
MITSUBISHI CHEMICAL COMPOSITES AMERICA, INC.
401 Volvo Parkway, Chesapeake, VA 23320
Telephone: 800.422.7270, Facsimile: 757.436.1896
www.alpolicamericas.com e-mail: info@alpolic.com



2019-4

ALPOLIC®

METAL COMPOSITE MATERIALS

Your Design | Perfected

# STOCK COLOR CHART

MITSUBISHI CHEMICAL COMPOSITES AMERICA, INC.

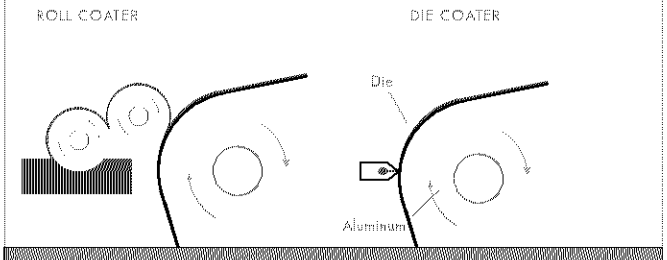
## Choose the Highest Standard of Quality, Durability and Beauty

*HIGH-PERFORMANCE FLUOROPOLYMER RESINS* – Our Lumiflon® FEVE and Kynar® PVDF resins are the most advanced architectural coatings available, meeting or exceeding AAMA 2605 specifications to deliver superior durability, weatherability and chemical resistance. Choose Lumiflon® FEVE for the broadest color palette with a gloss range from matte to high luster.

*SHORT RUN CAPABILITIES* – With our advanced die coating process and controlled curing, we can coil coat as little as 1,000 square feet of material in a broad choice of custom colors. You can count on the same color consistency, quality and lengthy warranty we offer for the largest orders. Gain practically unlimited design flexibility, thanks to our ability to deliver short runs of custom colors in your choice of 40-, 50- or 62-inch widths.

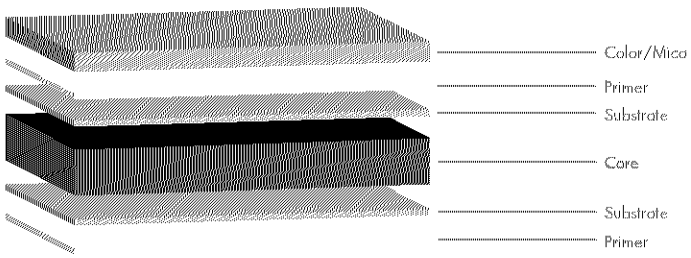
*GLOSS RANGE* – Different gloss levels can significantly change the eye's perception of color. If you would like a different gloss level than the sample you submit for color matching, let us know. We will work with you directly to ensure the gloss level you want is achieved.

*FINISH DIRECTIONALITY* – For best color consistency, maintain the same directionality throughout design, estimation, fabrication and construction. We recommend ordering finishes for your entire job at one time, from one lot of material.

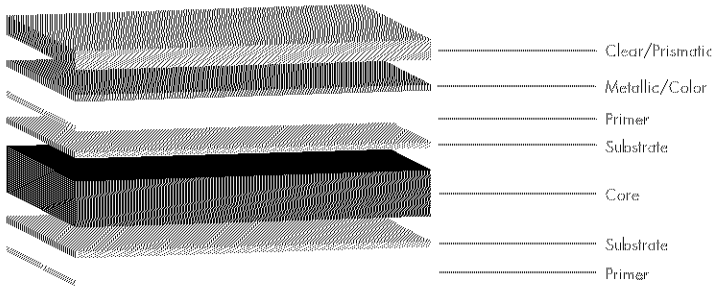



DIE COATING VS. ROLL COATING
Although widely used roll coaters can achieve adequate quality and efficiency, our advanced die coaters permit direct coating on the aluminum surface to ensure smoother, finer finishes without roping marks.

### 2 Coat Solid/Mica




### 3 Coat Metallic/Prismatic




*LIGHT REFLECTANCE VALUE* – LRV numbers indicate the percentage of visible light reflected by the surface. This value is defined in ASTM C609 as the Y value in an XYZ/Yxy color space. While the LRV values shown on this chart are typical, there can be slight variations between individual lots.

*SOLAR REFLECTANCE INDEX* – SRI numbers, as defined by ASTM E1980 using 12 W/m2K values, indicate the material's reflectivity (how well it reflects back instead of absorbing radiant energy) and emissivity (how well it radiates absorbed heat back into the environment). The Cool Roof Rating Council (CRRC) requires an SRI value of 29 or greater for steep-slope roofs to earn a "Cool" rating. Most of our Architectural stock colors meet this requirement, and we have added "Cool" after the SRI value for easy reference.

For expert assistance with product availability, material selection, sizing and colors, please contact your local ALPOLIC® sales manager.

# Exceptional projects demand exceptional products. For more than 40 years, ALPOLIC® has delivered premium metal composite materials that are durable, sustainable and truly remarkable.

*We offer an extensive selection of rich, vibrant colors and styles for both painted and natural metal surfaces, working with you to bring your design intent to reality. Rigid, lightweight panels that fulfill your vision with a finish of enduring quality – that's the beauty of ALPOLIC® materials.*

***Choose ALPOLIC® and bring your vision to life!***

## Architectural Stock Finishes and Colors

***STOCK*** painted colors are available on 4mm-thick panels, with many of the most popular choices stocked in a selection of widths and lengths. Specify a polyethylene (PE) or fire-resistant (fr) core – required by fire codes when building over 40 feet. Then choose a fluoropolymer paint finish offered in a variety of solid colors, metallics and micas. These panels are manufactured to architectural standards and stocked for immediate shipment.

***ANODIZED*** panels are manufactured with 1100 alloy aluminum. They are available in both 50- and 62-inch widths with a stock clear anodized Class 1 finish or a choice of five custom Class 1 colors.

***NATURAL METALS*** offer a traditional look in a state-of-the-art panel system. These 4mm panels offer your choice of metal surface while retaining the flatness and workability of aluminum composite.

## Corporate Identity - Stock Program Colors

***PROGRAM*** or 10 year finish warranty colors are stocked in the standard options shown, or can be custom-created for your unique project. We use the advanced Lumiflon® FEVE fluoropolymer resin in two or three coats, or the Kynar® PVDF coating system to create a vivid, extremely durable finish in an astoundingrange of colors and glosses, including metallic and mica options. Panels are stocked in either 3mm or 4mm thickness.

## Specialty Stock Colors and Finishes

***TIMBER SERIES*** finishes are produced using our proprietary image-transfer process in concert with Lumiflon® FEVE fluoropolymer coatings, providing exceptional protection with the classic beauty of stone or timber. We stock standard 62-inch panels for your immediate needs.

***PRISMATIC*** finishes combine Lumiflon® FEVE fluoropolymer technology with specialized pigments to create unique colors and effects. The resulting finishes can make the surface glisten or even change colors with different lighting or the movement of the sun. Consult our Prismatic brochure to find the perfect color, gloss and effect for your design.

***DECORATIVE*** panels use specially treated aluminum surfaces with crystal-clear coats of Lumiflon® FEVE resin to protect the panels and maintain a pristine look, even in harsh exterior applications. HPA offers a polished shine, while HLZ has the look of brushed stainless steel.

***MULTI-COLOR*** panels incorporate an advanced coating process engineered by ALPOLIC® to accommodate almost any color scheme. From bright and glossy to muted and subtle, these rich and versatile color systems can only be accomplished by combining Lumiflon® FEVE technology with our advanced die coil coating system. We can work with you to help you choose the perfect look to convey your message.

***CUSTOM COLORS*** – Bright, clean high-gloss colors, rich metallics, low-gloss earth tones, prismatic special effects and more: If you can imagine a color, we can make it real. Contact customer service to connect with our color experts.

CASE #PL2019-40

## 30 Year Finish Warranty Architectural Stock Colors

Stocked in 4mm unless otherwise stated

### SOLID

**BNT Bone White**
4-BNT-30
LRV 78.50/SRI 82-Cool

**CRT Oyster**
4-CRT-30
LRV 72.46/SRI 82-Cool

SIDING 5C

APPROVED

**MST Mist White**
4-MST-30
LRV 69.96/SRI 75-Cool

**AGT Aluminum Grey**
4-AGT-30
LRV 31.60/SRI 26

SIDING 5F

APPROVED

**BGY Grey**
4-BGY-50
LRV 10.41/SRI 7

SIDING 5E

APPROVED

**CNC Charcoal**
3-CNC-30
LRV 4.20
3&4mm

**JBR Bronze**
4-JBR-30
LRV 3.34/SRI 2

**TOB Black**
4-TOB-15
LRV 1.01/SRI 0

Order samples at
www.alpolic-americas.com/samples

### MICA

**OPT Mica Platinum**
4-OPT-50
LRV 30.88/SRI 53-Cool

**MNC Mica Anodic Clear**
4-MNC-30
LRV 34.43/SRI 56-Cool

**MCU Mica Champagne**
4-MCU-30
LRV 22.61/SRI 38-Cool

**MZG Mica Grey**
4-MZG-50
LRV 7.95/SRI 14

**MFS Mica Grey**
4-MFS-30
LRV 13.41

### METALLIC

**BSX Metallic Silver**
4-BSX-30
LRV 30.94/SRI 71-Cool

**SMX Metallic Silver**
4-SMX-30
LRV 36.59/SRI 63-Cool

**CMX Metallic Champagne**
4-CMX-30
LRV 31.19/SRI 59-Cool

**MBX Metallic Bronze**
4-MBX-30
LRV 31.20/SRI 40-Cool

**DCX Metallic Copper**
4-DCX-30
LRV 15.09/SRI 47-Cool

## Premium Architectural Stock Finishes

Call ALPOLIC® Customer Service for Warranty Details 800.422.7270

### NATURAL METALS

**Stainless**
4-4HL
LRV 21.84/SRI 34-Cool

**Quartz Zinc**
4-AZZ
LRV 21.51/SRI 0

**Copper**
4-C12
LRV 5.03/SRI 55-Cool

### ANODIZED

**Clear**
4-CLR
LRV 34.31/SRI 84-Cool

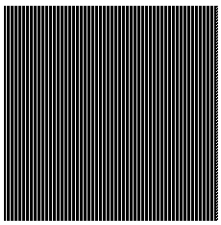
*Colors shown are as close to actual colors as allowed by the printing process. Mitsubishi Chemical Composites America, Inc. reserves the right to change or delete information herein without prior notice. Please refer to warranty details for exclusions and limitations. Additional warranty coverage may be given to some projects/products. Please call 800.422.7270 for more information.

# 20 Year Finish Warranty Stock Colors

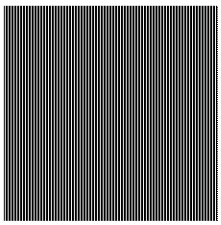
CASE #PL2019-40

Stacked in 4mm unless otherwise stated

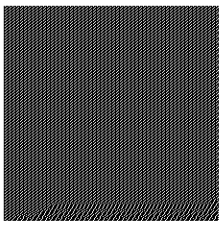
## SOLID



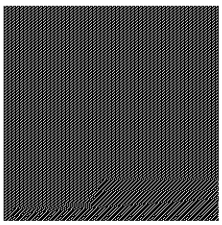
**BBR Red**
4-BBR-30
LRV 8.06
*3&4mm*



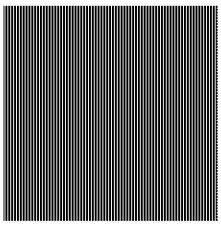
**BTR Red**
4-BTR-50
LRV 11.57
*3&4mm*



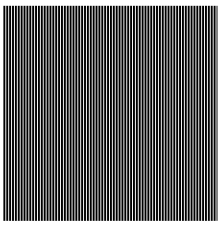
**TOR Red**
4-TOR-70
LRV 9.06



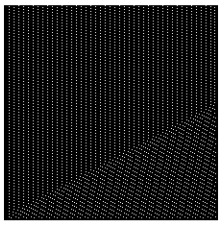
**JLR Red**
4-JLR-50
LRV 5.44



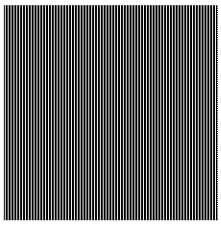
**JXR Red**
4-JXR-30
LRV 10.50



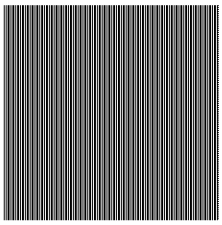
**TRC Red**
4-TRC-30
LRV 8.52



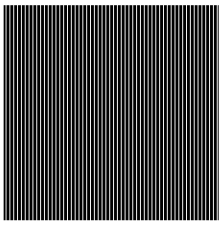
**AUB Blue**
4-AUB-50
LRV 3.25



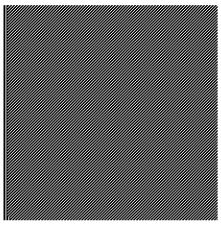
**CVB Blue**
4-CVB-70
LRV 13.79



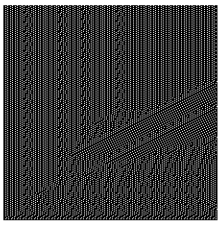
**HNB Blue**
4-HNB-50
LRV 16.78



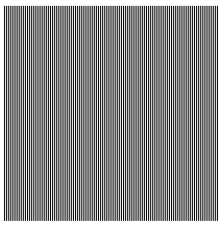
**RTB Blue**
4-RTB-60
LRV 9.06



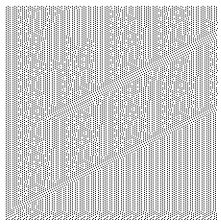
**MBU Blue**
4-MBU-30
LRV 10.59



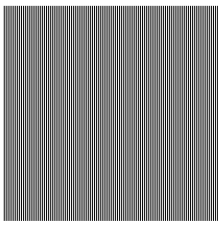
**HYB Blue**
4-HYB-30
LRV 4.20



**ABE Blue**
4-ABE-70
LRV 23.73



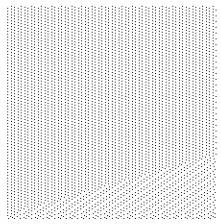
**AYW Yellow**
4-AYW-70
LRV 61.77



**TDR Green**
4-TDR-70
LRV 24.40

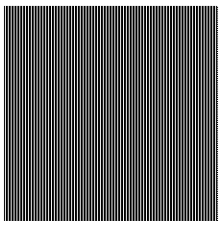
**RVW White**
4-RVW-50
LRV 86.34

**HWH White**
4-HWH-50
LRV 80.8

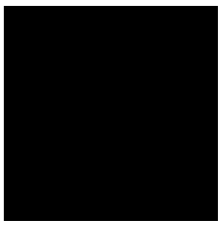


**COW White**
4-COW-30
LRV 68.67

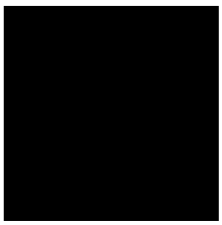
## MATTE



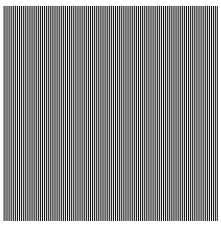
**CVG Grey**
4-CVG-50
LRV 14.38
3&4mm



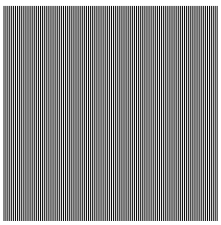
**BLX Black**
4-BLX-30
LRV 0.89
3&4mm



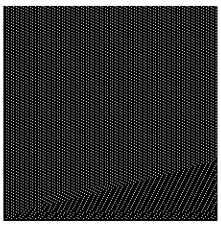
**TBL Black**
4-TBL-70
LRV 0.75
3&4mm



**RRM River Rock Grey**
4-RMM-6
LRV 23
SRI 17

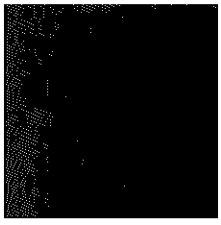


**TRM Terra Cotta**
4-TRM-6
LRV 17
SRI 16.9



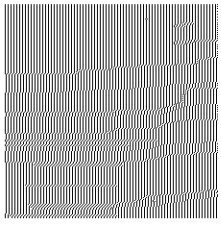
**BSM Slate Black**
4-BSM-6
LRV 5
SRI 1

## MICA

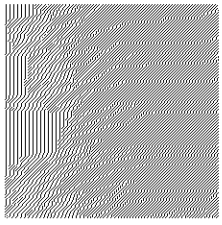


**MRO Anthracite Grey**
4-MRO-70
LRV 3.33

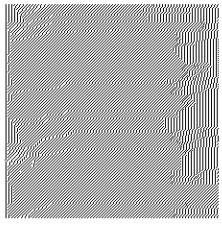
## METALLIC



**PEX Pewter Metallic**
4-PEX-30
LRV 20.63



**TSZ Silver Metallic**
4-TSZ-70
LRV 32.00



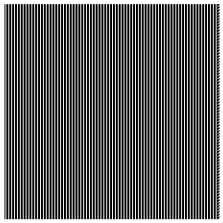
**TBX Silver Metallic**
4-TBX-30
LRV 38.75
3&4mm

*Colors shown are as close to actual colors as allowed by the printing process. Mitsubishi Chemical Composites America, Inc. reserves the right to change or delete information herein without prior notice. Please refer to warranty details for exclusions and limitations. Additional warranty coverage may be given to some projects/products. Please call 800.422.7370 for more information.

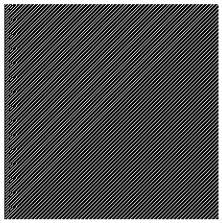
# 10 Year Finish Warranty Stock Colors

Stocked in 3mm unless otherwise stated

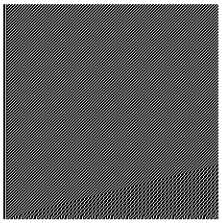
SOLID



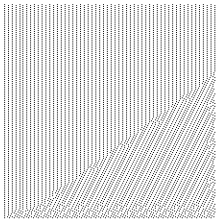
**STR Red**
3-STR-70
LRV 12.55



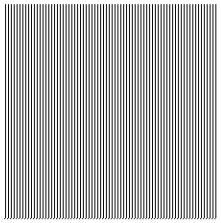
**TRD Red**
3-TRD-70
LRV 10.26



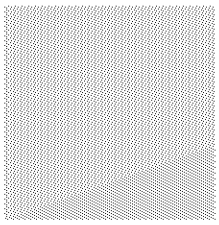
**FEF Red**
3-FEF-70
LRV 11.64



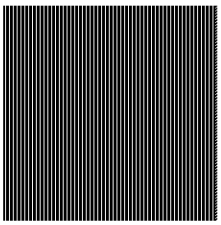
**BPS Pearl**
3-BPS-30
LRV 68.79



**ETT Tan**
3-ETT-30
LRV 47.87



**CRY Oyster**
3-CRY-50
LRV 72.30

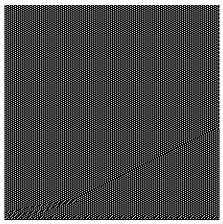


**MCV White**
3-MCV-70
LRV 68.21

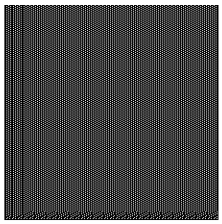
**SAW White**
3-SAW-70
LRV 80.62/3&4mm

**EWH White**
3-EWH-70
LRV 90.01

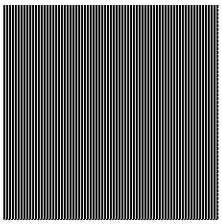
**DYB Blue**
3-DYB-50
LRV 10.06



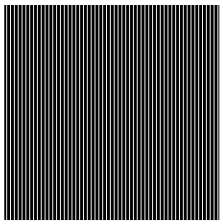
**CFB Blue**
3-CFB-70
LRV 7.24



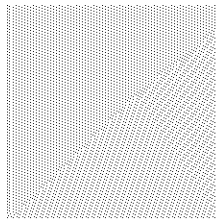
**SHB Blue**
3-SHB-70
LRV 4.12/3&4mm



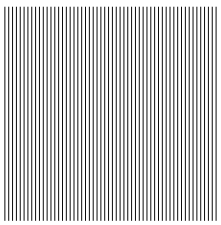
**BGN Green**
3-BGN-50
LRV 14.39



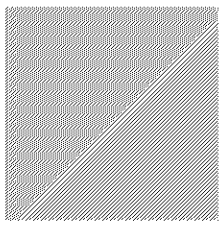
**GRV Green**
4-GRV-30
LRV 11.25



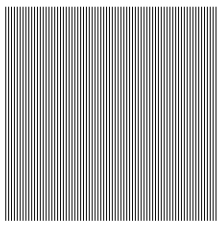
**BYL Yellow**
3-BYL-50
LRV 65.93



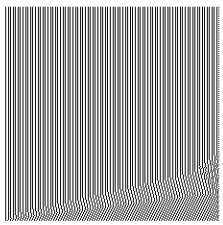
**EYL Yellow**
3-EYL-30
LRV 48.05



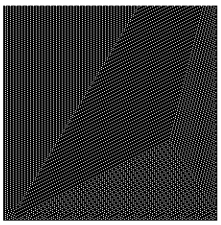
**YLW Yellow**
3-YLW-50
LRV 49.88



**SOG Grey**
3-SOG-70
LRV 49.50



**TXG Grey**
3-TXG-70
LRV 40.69

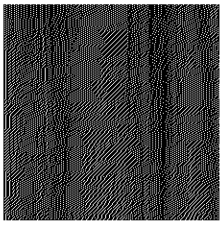


**SBR Bronze**
3-SBR-30
LRV 6.32

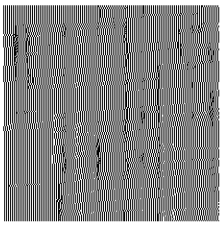
Order samples at www.alpolic-americas.com/samples

# Specialty Stock Colors/Finishes

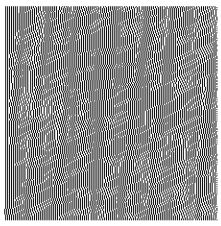
## TIMBER SERIES | 20 Year Finish Warranty | Call ALPOLIC® Customer Service for Warranty Details



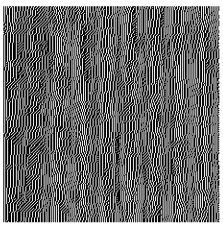
**QBB Teak**
4-QBB-30
LRV N/A



**QCP HT Bamboo**
4-QCP-30
LRV N/A

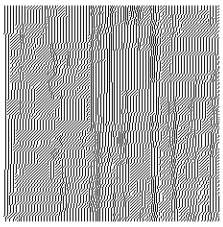


**MPL Maple**
4-MPL-30
LRV N/A

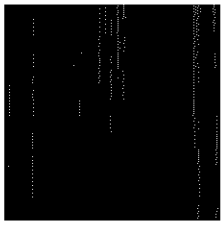


**WLN Walnut**
4-WLN-30
LRV N/A

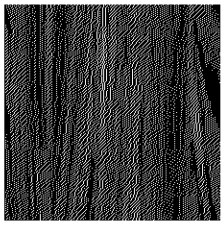
**QAE Mahogany**
4-QAE-30
LRV N/A



**QBV Oriental Cane**
4-QBV-30
LRV N/A

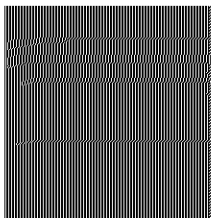


**QBT Zebrawood**
4-QBT-30
LRV N/A

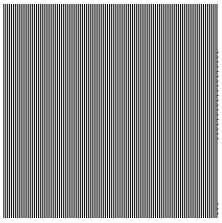


**QAW Rio Aleon**
4-QAW-30
LRV N/A

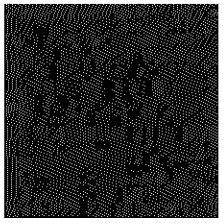
## EFFECTS SERIES | Call ALPOLIC® Customer Service for Warranty Details



**MRT Magma Prismatic**
3-MRT-70
LRV 11.33

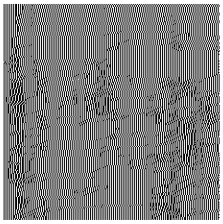


**DQO Orange Pearlescent**
3-DQO-70
LRV 22.21



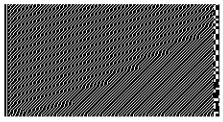
**DQS Maroon Gold Shimmer**
4-DQS-70
LRV 5.09
4mm only

## PATTERN | 20 Year Finish Warranty

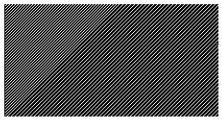


**QCO Rusted Steel**
4-QCO-20
LRV 16.17

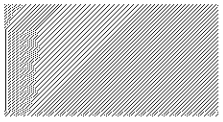
## MULTI-COLOR



**Red/White**
10 Year Finish Warranty
3-209-70
LRV 11.64
SRI 80.90



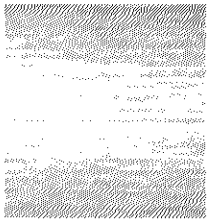
**Blue/White**
10 Year Finish Warranty
3-207-70
LRV 8.00
SRI 81.04



**Yellow/White**
10 Year Finish Warranty
3-234/238-35
LRV 48.05
SRI 90.01

## DECORATIVE

**HPA High Polished Aluminum**
5 Year Finish Warranty
3-HPA-70
LRV 0.88



**CLZ Aluminum**
20 Year Finish Warranty
4-CLZ-70
LRV 35.2

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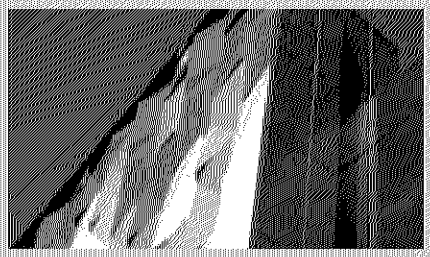
CASE #PL2019-40



Lumiflon® FEVE, a remarkable second-generation fluoropolymer coating, meets the weatherability and chemical-resistance standards you would expect from PVDF finishes, but delivers unprecedented design and performance advantages – a rich palette of vivid colors, a full gloss range, excellent adhesion, recoatability and even ambient cure capabilities.

| | FEVE/Lumiflon® | PVDF/Kynar® |
|---|---|---|
| **Durability** | Meets AAMA 2605 | Meets AAMA 2605 |
| **Color Range** | Bright to Muted | Muted Only |
| **Color Retention** | Excellent | Excellent |
| **Gloss Range** | 10–70 | 10–40 |
| **Gloss Retention** | Excellent | Excellent |
| **Chalking Resistance** | Excellent | Excellent |
| **Field Touch-Up** | Excellent | Poor |
| **Marring Resistance** | Excellent | Good |

For additional information, samples or a list of ALPOLIC® fabricators, please call 1-800-422-7270 or visit www.alpolic-americas.com.

ALPOLIC®
METAL COMPOSITE MATERIALS

MITSUBISHI CHEMICAL COMPOSITES AMERICA, INC.

401 Volvo Parkway, Chesapeake, VA 23320
Telephone: 800-422-7270 | Fax: 757-436-1896
www.alpolic-americas.com | e-mail: info@alpolic.com



LITAP3000 Rev 19 A
OCT 2019

LUMIFLON
FEVE RESIN

A Group Company of
MITSUBISHI CHEMICAL

CASE #PL2019-40

# ALPOLIC Technical Summary

| | Property | Standard | Alpolic | | | | | unit |
|---|---|---|---|---|---|---|---|---|
| | | | PE | | | fr | | |
| | | | 3 mm | 4 mm | 6 mm | 4 mm | 6 mm | |
| Physical Properties | Aluminum Skin Thickness | | | | 0.02 | | | inch |
| | | | | | 0.5 | | | mm |
| | Weight | | 0.93 | 1.12 | 1.5 | 1.56 | 2.23 | lb/ft^2 |
| | | | 4.54 | 5.47 | 7.32 | 7.62 | 10.89 | kg/m^2 |
| | Sound Transmission Coefficient | ASTM E90 | 25 | 26 | 26 | — | — | dB |
| | Coefficient of Thermal Expansion | | | | 0.000013 | | | in/in-°F |
| | | | | | 0.0000234 | | | mm/mm-°C |
| | Drum Peel | ASTM D1781 | 33.6 | 33.6 | 33.6 | 27.6 | — | lb-in/in |
| | | | 150 | 150 | 123 | 110 | — | N-mm/mm |
| Fire Resistance Properties | Smoke Developed Index | ASTM E84 | 15 | 0 | 10 | 10 | 0 | — |
| | Flame Spread Index | ASTM E84 | 5 | 0 | 0 | 0 | 0 | — |
| | Flash Ignition Temperature | ASTM D1929 | — | 716 | 716 | 811 | 811 | °F |
| | | | — | 380 | 380 | 432.8 | 432.8 | °C |
| | Self Ignition Temperature | ASTM D1929 | — | 752 | 752 | 837 | 837 | °F |
| | | | — | 400 | 400 | 447.2 | 447.2 | °C |
| | Rate of Burning | ASTM D635 | — | CC1 | — | — | — | — |
| | ISMA Test | UBC 26-9 | — | — | — | Pass | Pass | — |
| | Potential Heat Release | UBC 17-2 | — | — | — | <6000 | — | BTU/ft^2 |
| | Other Fire Tests | ASTM E162 | — | 0 | — | 0 | — | — |
| | | ASTM E108 | Pass | Pass | Pass | Pass | Pass | — |
| | | ASTM E119 | — | — | — | Pass | — | — |
| | | UL-94 | V-O rating | V-O rating | — | — | — | — |
| | | UL-879 | Pass | Pass | — | — | — | — |
| | | NFPA-285 | — | — | — | Pass* | Pass* | — |
| Production Tolerances | Width | | | | 0.08 | | | inches |
| | | | | | 2 | | | mm |
| | Length | | | | 0.16 | | | inches |
| | | | | | 4 | | | mm |
| | Thickness | | 0.008 | | 0.012 | 0.008 | 0.012 | inches |
| | | | 0.2 | | 0.3 | 0.2 | 0.3 | mm |
| | Bow | | | | 0.5 | | | % |
| | Squareness (Diagonal Difference) | | | | 0.2 | | | inches |
| | | | | | 5 | | | mm |
| LEED | Post-Consumer Recycled Content | | 7.4 | 6.2 | 4.6 | 4.4 | 3.1 | % |
| | Pre-Consumer Recycled Content | | 58.4 | 57 | 55.25 | 22.7 | 15.9 | % |
| | Total = 100% Post + 50% Pre | | 36.6 | 34.7 | 32.2 | 15.76 | 11.1 | % |
| AAMA 2605** | 8.1 Color Uniformity | | | | Pass | | | — |
| | 8.2 Specular Gloss | | | | Pass | | | — |
| | 8.3 Dry Film Hardness | | | | Pass | | | — |
| | 8.4 Film Adhesion | | | | Pass | | | — |
| | 8.5 Impact Resistance | | | | Pass | | | — |
| | 8.6 Abrasion Resistance | | | | Pass | | | — |
| | 8.7 Chemical Resistance | | | | Pass | | | — |
| | 8.8 Corrosion Resistance | | | | Pass | | | — |
| | 8.9 Weathering | | | | Pass | | | — |
| Code Approvals | ICC-ES | | ESR-3704 | | | ESR-2653 | | — |
| | Florida | | FL10520-R3, FL12087-R2, FL17186-R2 | | | | | — |
| | Miami-Dade County | | 14-0610.01***, 14-0610.02*** | | | | | — |
| | City of LA | | 26029 | | | 26008 | | — |
| | Warnock Hersey | | — | | | Certified: ASTM E119; ASTM E84 (2013a); CAN / ULC S102; CAN / ULC S134; NFPA 285 | | — |

*NFPA 285 is a system test. Alpolic passed as a system component.

**ASTM Tests listed on following page

***number changes upon renewal.

| AAMA 2605 Section | Section Title | ASTM Test Referenced | Test Title |
|---|---|---|---|
| 5.3 | — | D7091-12 | Standard Practice for Nondestructive Measurement Of Dry Film Thickness Of Nonmagnetic Coatings Applied To Ferrous Metals And Nonmagnetic, Non Conductive Coatings Applied To Non-Ferrous Metals |
| 7.2.1 | Chemical Conversion Coating Weight Procedure | D5723-95(2010) | Standard Practice for Determination Of Chromium Treatment Weight On Metal Substrates By X-Ray Fluorescence |
| 8.1.2 | Color Uniformity Performance | D2244-11 | Standard Practice for Calculation Of Color Tolerances And Color Differences From Instrumentally Measured Color Coordinates |
| 8.2.1 | Specular Gloss Procedure | D523-08 | Standard Test Method for Specular Gloss |
| 8.3.1 | Dry Film Hardness Procedure | D3363-05(2011)e2 | Standard Test Method for Film Hardness By Pencil Test |
| 8.3.2 | Dry Film Hardness Performance | D3363-05(2011)e2 | Standard Test Method for Film Hardness By Pencil Test |
| 8.4.1.2 | Film Adhesion Procedure: Tape Pull-Off | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| 8.5.1 | Impact Resistance Procedure | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| 8.6.1 | Abrasion Resistance Procedure | D968-05(2010) | Standard Test Method for Abrasion Resistance Of Organic Coatings By Falling Abrasive |
| 8.7.2.1 | Chemical Resistance: Mortar Resistance Procedure | C207-06(2011) | Standard Specification for Hydrated Lime For Masonry Purposes |
| 8.7.3.2 | Chemical Resistance: Nitric Acid Resistance Performance | D2244-11 | Standard Practice for Calculation Of Color Tolerances And Color Differences From Instrumentally Measured Color Coordinates |
| 8.7.4.1 | Chemical Resistance: Detergent Resistance Procedure | D2248-01a(2007) | Standard Practice for Detergent Resistance Of Organic Finishes |
| 8.7.4.1 | Chemical Resistance: Detergent Resistance Procedure | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| 8.8.1.1 | Corrosion Resistance: Humidity Resistance Procedure | D2247-11 | Standard Practice for Testing Water Resistance Of Coatings In 100% Relative Humidity |
| 8.8.1.1 | Corrosion Resistance: Humidity Resistance Procedure | D4585-07 | Standard Practice for Testing Water Resistance Of Coatings Using Controlled Condensation |
| 8.8.1.2 | Corrosion Resistance: Humidity Resistance Performance | D714-02(2009) | Standard Test Method for Evaluating Degree Of Blistering Of Paints |
| 8.8.2.1 | Corrosion Resistance: Cyclic Corrosion Testing Procedure | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| 8.8.2.1 | Corrosion Resistance: Cyclic Corrosion Testing Procedure | G85-11 | Standard Practice for Modified Salt Spray (Fog) Testing |
| 8.8.2.2 | Corrosion Resistance: Cyclic Corrosion Testing Performance | D1654-08 | Standard Test Method for Evaluation Of Painted Or Coated Specimens Subjected To Corrosive Environments |
| 8.9.1.1 | Weathering: Testing Site and Duration | G7/G7M-13 | Standard Practice for Atmospheric Environmental Exposure Testing Of Nonmetallic Materials |
| 8.9.1.2.1 | Weathering: Color Retention Performance | D2244-11 | Standard Practice for Calculation Of Color Tolerances And Color Differences From Instrumentally Measured Color Coordinates |
| 8.9.1.3.1 | Weathering: Chalk Resistance Performance | D4214-07 | Standard Test Method for Evaluating The Degree Of Chalking Of Exterior Paint Film |
| 8.9.1.4.1 | Weathering: Gloss Retention Procedure | D523-08 | Standard Test Method for Specular Gloss |
| 8.9.1.5.1 | Weathering: Resistance to Erosion Procedure | B244-09 | Standard Test Method for Measurement Of Thickness Of Anodic Coatings On Aluminum Nonconductive Coatings On Nonmagnetic Basis Metals With Eddy Current Instruments |
| A3.1 | — | D7091-12 | Standard Practice for Nondestructive Measurement Of Dry Film Thickness Of Nonmagnetic Coatings Applied To Ferrous Metals And Nonmagnetic, Non Conductive Coatings Applied To Non-Ferrous Metals |
| A5.1.1.1 | T-Bend Test for Coating Flexibility | D4145-10 | Standard Test Method for Coating Flexibility Of Prepainted Sheet |
| A5.1.1.5 | T-Bend Test for Coating Flexibility | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| A5.2.1 | Impact Resistance: Direct Impact | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| A5.2.2 | Impact Resistance: Reverse Impact | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |

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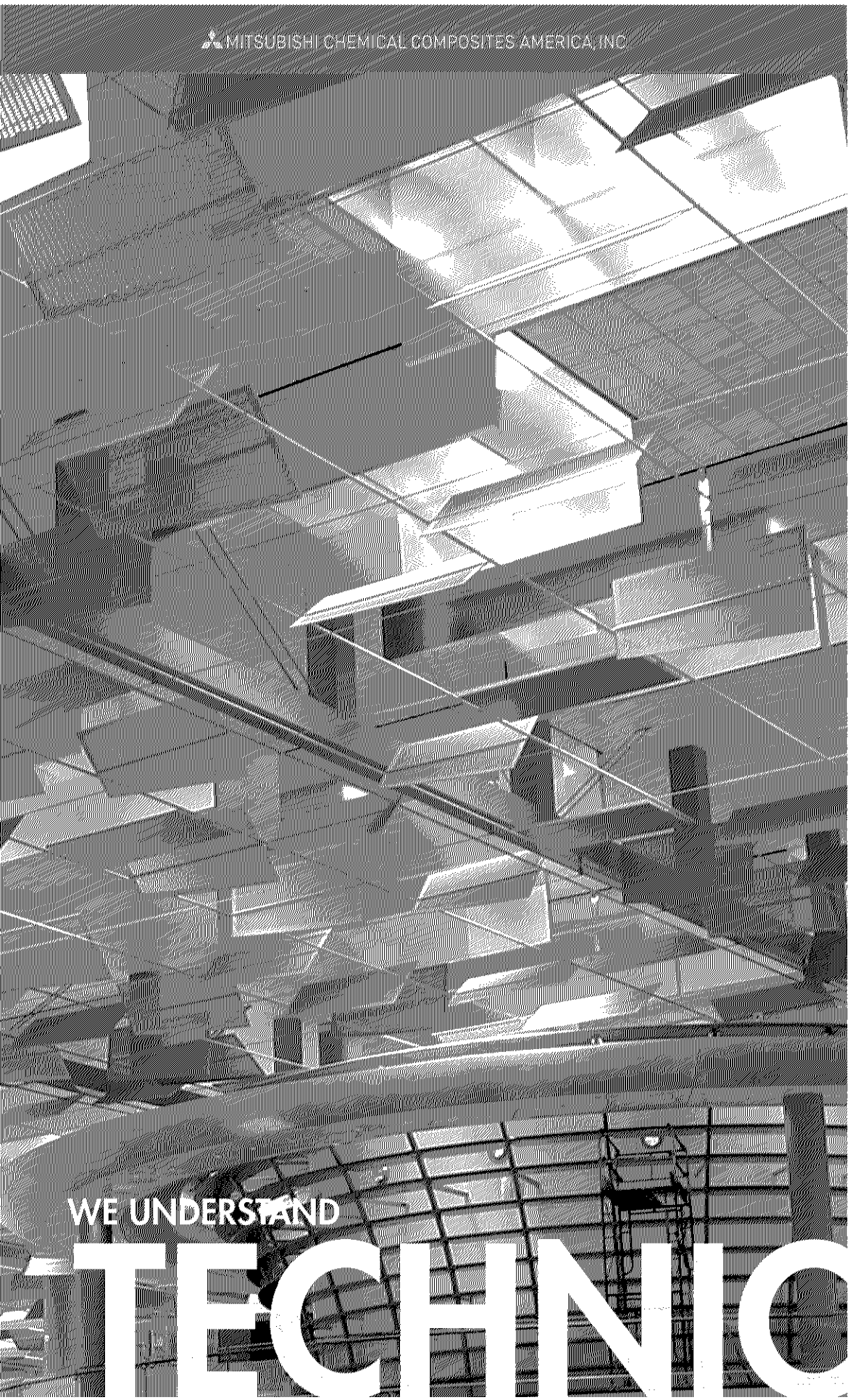

ALPOLIC

METAL COMPOSITE MATERIALS

Your Design Perfected

WE UNDERSTAND

# TECHNICAL

TECHNICAL BROCHURE

# ALPOLIC®/PE TECHNICAL INFORMATION

## IMPACT RESISTANCE BY DUPONT METHOD

| | | ALPOLIC®/PE DENT DEPTH (x10⁻² IN) | | |
|---|---|---|---|---|
| STEEL BALL | HEIGHT | 3MM .118" | 4MM .157" | 6MM .236" |
| 1.10 lb | 20 in | 6.30 | 5.51 | 3.15 |
| 2.20 lb | 12 in | 7.87 | 6.69 | 3.93 |
| 2.20 lb | 20 in | 10.23 | 9.05 | 5.90 |

## BOND INTEGRITY

| | | | ALPOLIC®/PE TOTAL THICKNESS | | |
|---|---|---|---|---|---|
| PROPERTY | UNIT | ASTM | 3MM .118" | 4MM 157" | 6MM .236" |
| Vertical Pull | psi | C-297 | 1906 | 1806 | 1664 |
| Drum Peel | in-lb/in | D-1781 | 33.6 | 33.6 | 33.6 |
| Flatwise Shear | psi | C-273 | 1259 | 1225 | 1195 |

## ENGINEERING PROPERTIES

| | | | ALPOLIC®/PE TOTAL THICKNESS | | |
|---|---|---|---|---|---|
| PROPERTY | UNIT | ASTM | 3MM .118" | 4MM .157" | 6MM .236" |
| Aluminum Thickness | in | - | .020 | .020 | .020 |
| Specific Gravity | - | - | 1.52 | 1.38 | 1.23 |
| Weight | lbs/ft² | - | 0.93 | 1.12 | 1.50 |
| Coefficient of Expansion | in/in/°F | D-696 | $13x10^{-6}$ | $13x10^{-6}$ | $13x10^{-6}$ |
| Thermal Conductance | BTU/hr/°F/ft² | C-1363 | 12.29 | 10.75 | 8.53 |
| Tensile Yield Strength | psi | E-8 | 8321 | 6429 | 4466 |
| Tensile Strength | psi | E-8 | 8747 | 6913 | 4978 |
| Elongation | % | E-8 | 12.1 | 13.5 | 17.3 |
| Flexural Elasticity | psi | C-393 | $7110x10^3$ | $5770x10^3$ | $4220x10^3$ |
| Flexural Stiffness | psi | C-393 | $1.04x10^9$ | $1.99x10^9$ | $4.98x10^9$ |
| Punching Shear Resistance | | | | | |
| Maximum Load | lbs | D-732 | 1847 | 1920 | 2121 |
| Shear Resistance | psi | D-732 | 4950 | 4025 | 2816 |
| Deflection Temperature | °F | D-648 | 231.8 | 231.8 | 231.8 |
| Sound Transmission Coefficient | STC# | E-90 | 25 | 26 | 26 |

## SURFACE TREATMENTS

Standard ALPOLIC®/PE with a polyethylene core is available in the following finishes: FEVE (LUMIFLON™) with a wide color and gloss range and PVDF, both fluoropolymer finishes tested to meet AAMA 2605, polyester, and class 1 anodized. Other available ALPOLIC® finishes include Stone and Timber Series and Reflective Finishes (RF).

## STANDARD PANEL SIZES

| | |
|---|---|
| 50" x 146" | 62"x 146" |
| 50" x 196" | 62" x 196" |

## RANGE OF SIZES

Width 32.5"—62" (826mm – 1575mm)

Length 6'—24' 2" (1829mm – 7315mm)

## PRODUCT TOLERANCE

| | | |
|---|---|---|
| Width: | ± 0.08" (2mm) | |
| Length: | ± 0.16" (4mm) | |
| Thickness: | 3mm: | ± 0.008" (0.2mm) |
| | 4mm: | ± 0.008" (0.2mm) |
| | 6mm: | ± 0.012" (0.3mm) |
| Bow: | maximum 0.5% of length and/or width | |
| Squareness Maximum | 0.2" (5mm) | |

ALPOLIC®/PE material is trimmed and squared with cut edges to offer the best panel edge conditions in the industry

## FIRE PERFORMANCE

Standard ALPOLIC®/PE with a polyethylene core has been tested by independent testing laboratories using the following nationally recognized fire tests.

| | | |
|---|---|---|
| **ASTM E84** | | |
| Flame spread: | 3mm | 05 |
| | 4mm | 00 |
| | 6mm | 00 |
| Smoke developed: | 3mm | 15 |
| | 4mm | 00 |
| | 6mm | 10 |
| **ASTM E108 MODIFIED** | | |
| | 4mm | passed |
| | 6mm | passed |
| **ASTM D1929** | | |
| Flash: | 4mm | 716°F |
| Ignition: | 4mm | 752°F |
| **ASTM D635** | | |
| Rate of burning: | 4mm | Classified CC1 |
| **ASTM E162** | | |
| Flame spread: | 4mm | 0 |
| **UL-879** | | listed |
| **UL-94** | 3mm | V-O rating |

**CODE Evaluation Reports***

1. ICC ES
2. City of Los Angeles Report
3. Miami Dade Notice of Acceptance
4. Floridga Building Code Approval
5. UL Approved

*Reports are available at:
www.alpolic-americas.com/documents

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# ALPOLIC®/fr TECHNICAL INFORMATION

## IMPACT RESISTANCE BY DUPONT METHOD

ALPOLIC®/fr

DENT DEPTH (x10$^{-2}$ IN)

| STEEL BALL | HEIGHT | 4MM .157" | 6MM .236" |
|---|---|---|---|
| 1.10 lb | 20 in | 5.07 | 3.93 |
| 2.20 lb | 12 in | 5.47 | 4.72 |
| 2.20 lb | 20 in | 7.40 | 6.30 |

## BOND INTEGRITY

ALPOLIC®/fr

TOTAL THICKNESS

| PROPERTY | HEIGHT | ASTM | 4MM .157" |
|---|---|---|---|
| Vertical Pull | psi | C-297 | 427 |
| Drum Peel | in-lb/in | D-1781 | 27.6 |
| Flatwise Shear | psi | C-273 | 949 |

## ENGINEERING PROPERTIES

ALPOLIC®/fr

TOTAL THICKNESS

| PROPERTY | UNIT | ASTM | 4MM .157" | 6MM .236" |
|---|---|---|---|---|
| Aluminum Thickness | in | - | .020 | .020 |
| Specific Gravity | - | - | 1.90 | 1.81 |
| Weight | lbs/ft$^2$ | - | 1.56 | 2.23 |
| Coefficient of Expansion | in/in/°F | D-696 | 13x10$^{-6}$ | 13x10$^{-6}$ |
| Tensile Yield Strength | psi | E-8 | 6344 | 3840 |
| Tensile Strength | psi | E-8 | 7126 | 4266 |
| Elongation | % | E-8 | 5.0 | 2.0 |
| Flexural Elasticity | psi | C-393 | 5770x10$^3$ | 4220x10$^3$ |
| Flexural Stiffness | psi | C-393 | 1.93x10$^9$ | 4.98x10$^9$ |
| Punching Shear Resistance | | | | |
| Maximum Load | lbs | D-732 | 2259 | --- |
| Shear Resistance | psi | D-732 | 4637 | --- |
| Deflection Temperature | °F | D-648 | 241.8 | 228.8 |

## SURFACE TREATMENTS

ALPOLIC ®/fr (fire-retardant) with a mineral filled core offers the same flatness, rigidity, workability, formability and quality features of standard ALPOLIC®/PE. ALPOLIC®/fr is curvable to a 6" radius and can be joined with hot melt adhesive to form complex shapes. In addition, ALPOLIC®/fr is available in the same full palette of bright, clean colors and gloss ranges as standard ALPOLIC ®/PE, as well as Stone Series, Anodized and Natural Metals. Extensive fire performance laboratory testing by independent testing agencies in accordance with requirements set forth by IBC has established ALPOLIC®/fr approval on Type 1, 2, 3, 4 and 5 Construction throughout the United States and Canada when used as a wall cladding material.

## FIRE PERFORMANCE

ALPOLIC®/fr (fire-retardant) has been tested by independent testing laboratories using the following nationally recognized fire tests.

| | | |
|---|---|---|
| **ASTM E84** | | |
| Flame spread: | 4mm | 00 |
| Smoke Developed: | 4mm | 10 |
| Flame spread: | 6mm | 00 |
| Flame spread: | 6mm | 00 |
| **ASTM E162** | | |
| Flame Spread: | 4mm | 0 |
| **ASTM E108 MODIFIED** | | Passed |
| **ASTM 1929** | | |
| Flash: | 4mm | 811°F |
| Ignition: | 4mm | 837°F |

## NFPA 285, INTERMEDIATE SCALE MULTI STORY APPARATUS TEST:

| | | |
|---|---|---|
| | 4mm | passed |
| | 6mm | passed |
| **ASTM E119** | | |
| | 4mm | passed |
| **CAN/ULC S 134M** | | |
| | 4mm | passed |
| **NFPA 259, POTENTIAL HEAT RELEASE** | | |
| | 4mm | <6000 BTU/ft$^2$ |

## COMBUSTION GAS TOXICITY PER UNIVERSITY OF PITTSBURGH

"No more toxic than wood."

## CODE EVALUATION REPORTS*

1. ICC ES
2. City of Los Angeles Report
3. Miami Dade Notice of Acceptance
4. Floridga Building Code Approval
5. CAN/ULC S102 & S134
6. ASTM E84 & E119
7. NFPA 285

*Reports are available at:
www.alpolic-americas.com/documents

CASE #PL2019-40

MITSUBISHI CHEMICAL COMPOSITES AMERICA, INC.

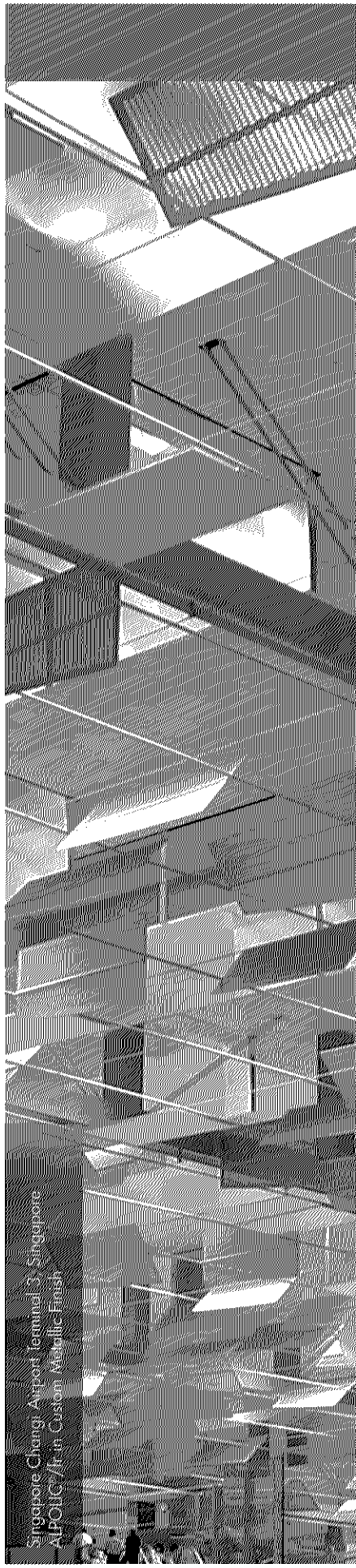


# EFFECTUAL

Let us know how we can help you make your design idea a reality. Get more information, order finish samples and find a fabricator by calling 1-800-422-7270 or visiting alpolic-americas.com.

ALPOLIC®
METAL COMPOSITE MATERIALS

Your Design **Perfected**

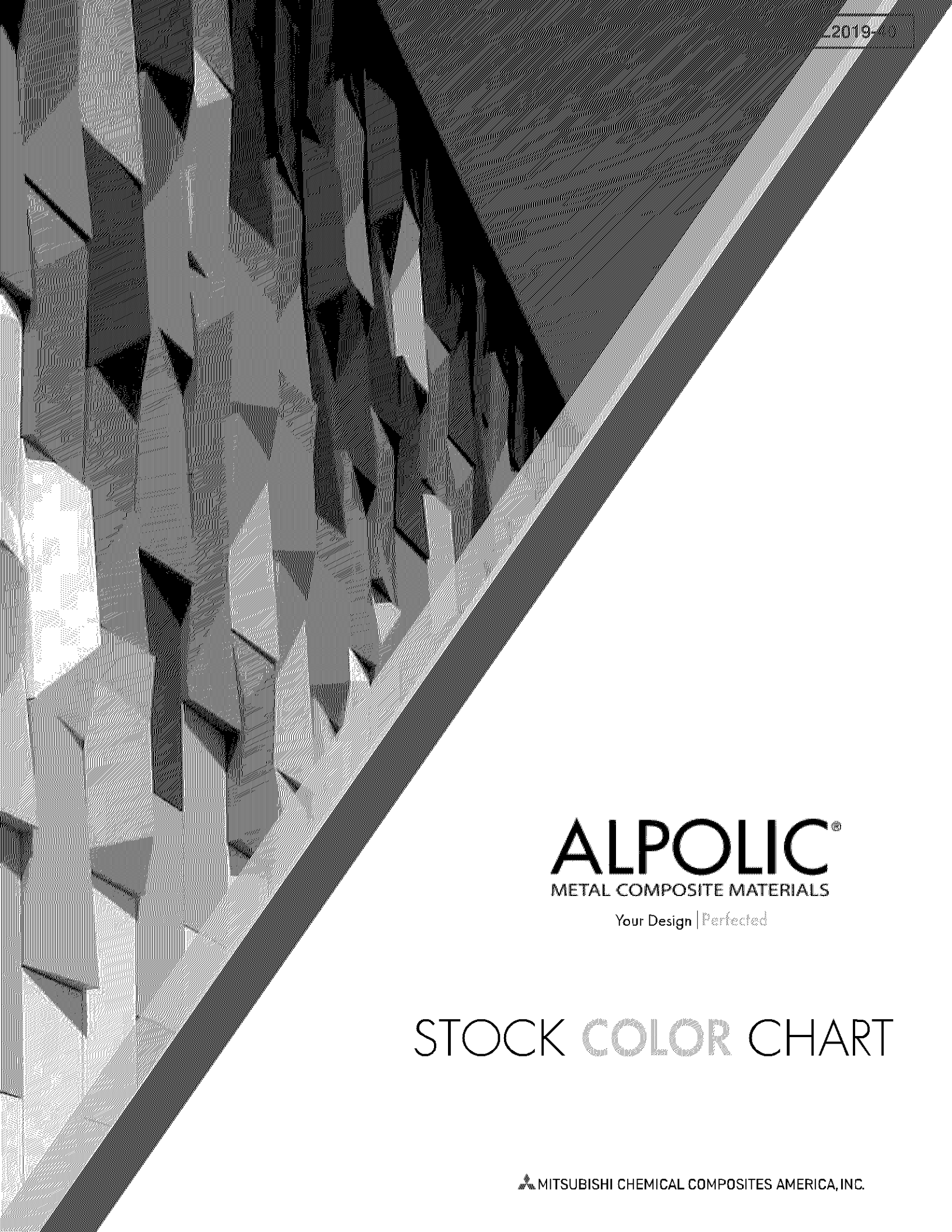



LITAP4000 REV B: September 2018

A Group Company of
MITSUBISHI CHEMICAL

THE KAITEKI COMPANY
Mitsubishi Chemical Holdings Group

LUMIFLON™
FEVE RESIN



2019-4

ALPOLIC®

METAL COMPOSITE MATERIALS

Your Design | Perfected

# STOCK COLOR CHART

MITSUBISHI CHEMICAL COMPOSITES AMERICA, INC.

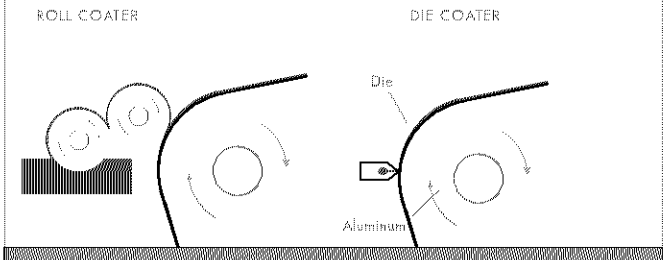
## Choose the Highest Standard of Quality, Durability and Beauty

*HIGH-PERFORMANCE FLUOROPOLYMER RESINS* – Our Lumiflon® FEVE and Kynar® PVDF resins are the most advanced architectural coatings available, meeting or exceeding AAMA 2605 specifications to deliver superior durability, weatherability and chemical resistance. Choose Lumiflon® FEVE for the broadest color palette with a gloss range from matte to high luster.

*SHORT RUN CAPABILITIES* – With our advanced die coating process and controlled curing, we can coil coat as little as 1,000 square feet of material in a broad choice of custom colors. You can count on the same color consistency, quality and lengthy warranty we offer for the largest orders. Gain practically unlimited design flexibility, thanks to our ability to deliver short runs of custom colors in your choice of 40-, 50- or 62-inch widths.

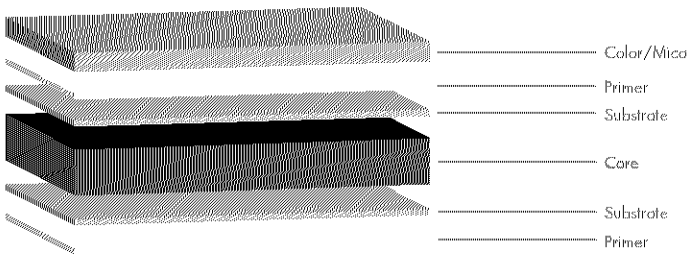
*GLOSS RANGE* – Different gloss levels can significantly change the eye's perception of color. If you would like a different gloss level than the sample you submit for color matching, let us know. We will work with you directly to ensure the gloss level you want is achieved.

*FINISH DIRECTIONALITY* – For best color consistency, maintain the same directionality throughout design, estimation, fabrication and construction. We recommend ordering finishes for your entire job at one time, from one lot of material.

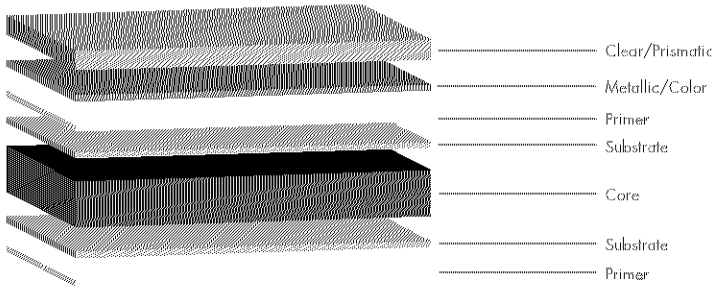



DIE COATING VS. ROLL COATING
Although widely used roll coaters can achieve adequate quality and efficiency, our advanced die coaters permit direct coating on the aluminum surface to ensure smoother, finer finishes without roping marks.

### 2 Coat Solid/Mica




### 3 Coat Metallic/Prismatic




*LIGHT REFLECTANCE VALUE* – LRV numbers indicate the percentage of visible light reflected by the surface. This value is defined in ASTM C609 as the Y value in an XYZ/Yxy color space. While the LRV values shown on this chart are typical, there can be slight variations between individual lots.

*SOLAR REFLECTANCE INDEX* – SRI numbers, as defined by ASTM E1980 using 12 W/m2K values, indicate the material's reflectivity (how well it reflects back instead of absorbing radiant energy) and emissivity (how well it radiates absorbed heat back into the environment). The Cool Roof Rating Council (CRRC) requires an SRI value of 29 or greater for steep-slope roofs to earn a "Cool" rating. Most of our Architectural stock colors meet this requirement, and we have added "Cool" after the SRI value for easy reference.

For expert assistance with product availability, material selection, sizing and colors, please contact your local ALPOLIC® sales manager.

# Exceptional projects demand exceptional products. For more than 40 years, ALPOLIC® has delivered premium metal composite materials that are durable, sustainable and truly remarkable.

*We offer an extensive selection of rich, vibrant colors and styles for both painted and natural metal surfaces, working with you to bring your design intent to reality. Rigid, lightweight panels that fulfill your vision with a finish of enduring quality – that's the beauty of ALPOLIC® materials.*

***Choose ALPOLIC® and bring your vision to life!***

## Architectural Stock Finishes and Colors

***STOCK*** painted colors are available on 4mm-thick panels, with many of the most popular choices stocked in a selection of widths and lengths. Specify a polyethylene (PE) or fire-resistant (fr) core – required by fire codes when building over 40 feet. Then choose a fluoropolymer paint finish offered in a variety of solid colors, metallics and micas. These panels are manufactured to architectural standards and stocked for immediate shipment.

***ANODIZED*** panels are manufactured with 1100 alloy aluminum. They are available in both 50- and 62-inch widths with a stock clear anodized Class 1 finish or a choice of five custom Class 1 colors.

***NATURAL METALS*** offer a traditional look in a state-of-the-art panel system. These 4mm panels offer your choice of metal surface while retaining the flatness and workability of aluminum composite.

## Corporate Identity - Stock Program Colors

***PROGRAM*** or 10 year finish warranty colors are stocked in the standard options shown, or can be custom-created for your unique project. We use the advanced Lumiflon® FEVE fluoropolymer resin in two or three coats, or the Kynar® PVDF coating system to create a vivid, extremely durable finish in an astoundingrange of colors and glosses, including metallic and mica options. Panels are stocked in either 3mm or 4mm thickness.

## Specialty Stock Colors and Finishes

***TIMBER SERIES*** finishes are produced using our proprietary image-transfer process in concert with Lumiflon® FEVE fluoropolymer coatings, providing exceptional protection with the classic beauty of stone or timber. We stock standard 62-inch panels for your immediate needs.

***PRISMATIC*** finishes combine Lumiflon® FEVE fluoropolymer technology with specialized pigments to create unique colors and effects. The resulting finishes can make the surface glisten or even change colors with different lighting or the movement of the sun. Consult our Prismatic brochure to find the perfect color, gloss and effect for your design.

***DECORATIVE*** panels use specially treated aluminum surfaces with crystal-clear coats of Lumiflon® FEVE resin to protect the panels and maintain a pristine look, even in harsh exterior applications. HPA offers a polished shine, while HLZ has the look of brushed stainless steel.

***MULTI-COLOR*** panels incorporate an advanced coating process engineered by ALPOLIC® to accommodate almost any color scheme. From bright and glossy to muted and subtle, these rich and versatile color systems can only be accomplished by combining Lumiflon® FEVE technology with our advanced die coil coating system. We can work with you to help you choose the perfect look to convey your message.

***CUSTOM COLORS*** – Bright, clean high-gloss colors, rich metallics, low-gloss earth tones, prismatic special effects and more: If you can imagine a color, we can make it real. Contact customer service to connect with our color experts.

## 30 Year Finish Warranty Architectural Stock Colors

CASE #PL2019-40

Stocked in 4mm unless otherwise stated

### SOLID

**BNT Bone White**
4-BNT-30
LRV 78.50/SRI 82-Cool

**CRT Oyster**
4-CRT-30
LRV 72.46/SRI 82-Cool

SIDING 5C

APPROVED

**MST Mist White**
4-MST-30
LRV 69.96/SRI 75-Cool

**AGT Aluminum Grey**
4-AGT-30
LRV 31.60/SRI 26

SIDING 5F

APPROVED

**BGY Grey**
4-BGY-50
LRV 10.41/SRI 7

SIDING 5E

APPROVED

**CNC Charcoal**
3-CNC-30
LRV 4.20
3&4mm

**JBR Bronze**
4-JBR-30
LRV 3.34/SRI 2

**TOB Black**
4-TOB-15
LRV 1.01/SRI 0

Order samples at
www.alpolic-americas.com/samples

### MICA

**OPT Mica Platinum**
4-OPT-50
LRV 30.88/SRI 53-Cool

**MNC Mica Anodic Clear**
4-MNC-30
LRV 34.43/SRI 56-Cool

**MCU Mica Champagne**
4-MCU-30
LRV 22.61/SRI 38-Cool

**MZG Mica Grey**
4-MZG-50
LRV 7.95/SRI 14

**MFS Mica Grey**
4-MFS-30
LRV 13.41

### METALLIC

**BSX Metallic Silver**
4-BSX-30
LRV 30.94/SRI 71-Cool

**SMX Metallic Silver**
4-SMX-30
LRV 36.59/SRI 63-Cool

**CMX Metallic Champagne**
4-CMX-30
LRV 31.19/SRI 59-Cool

**MBX Metallic Bronze**
4-MBX-30
LRV 31.20/SRI 40-Cool

**DCX Metallic Copper**
4-DCX-30
LRV 15.09/SRI 47-Cool

## Premium Architectural Stock Finishes

Call ALPOLIC® Customer Service for Warranty Details 800.422.7270

### NATURAL METALS

**Stainless**
4-4HL
LRV 21.84/SRI 34-Cool

**Quartz Zinc**
4-AZZ
LRV 21.51/SRI 0

**Copper**
4-C12
LRV 5.03/SRI 55-Cool

### ANODIZED

**Clear**
4-CLR
LRV 34.31/SRI 84-Cool

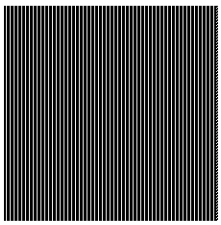
*Colors shown are as close to actual colors as allowed by the printing process. Mitsubishi Chemical Composites America, Inc. reserves the right to change or delete information herein without prior notice. Please refer to warranty details for exclusions and limitations. Additional warranty coverage may be given to some projects/products. Please call 800.422.7270 for more information.

# 20 Year Finish Warranty Stock Colors

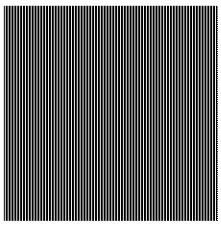
CASE #PL2019-40

Stocked in 4mm unless otherwise stated

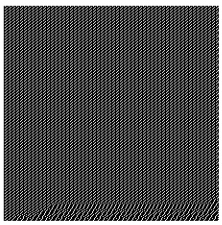
## SOLID



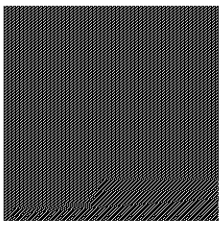
**BBR Red**
4-BBR-30
LRV 8.06
*3&4mm*



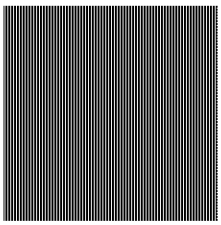
**BTR Red**
4-BTR-50
LRV 11.57
*3&4mm*



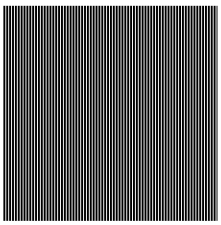
**TOR Red**
4-TOR-70
LRV 9.06



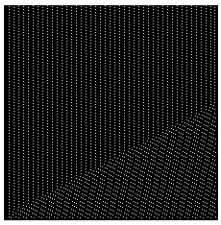
**JLR Red**
4-JLR-50
LRV 5.44



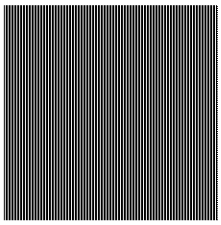
**JXR Red**
4-JXR-30
LRV 10.50



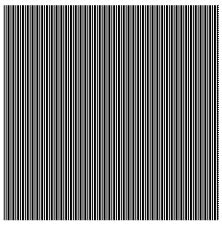
**TRC Red**
4-TRC-30
LRV 8.52



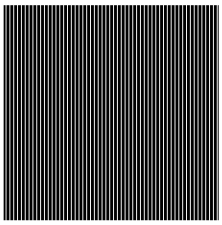
**AUB Blue**
4-AUB-50
LRV 3.25



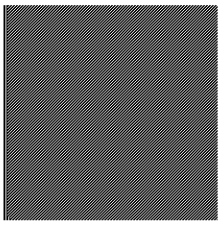
**CVB Blue**
4-CVB-70
LRV 13.79



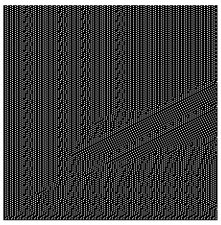
**HNB Blue**
4-HNB-50
LRV 16.78



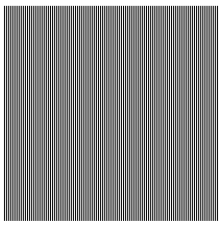
**RTB Blue**
4-RTB-60
LRV 9.06



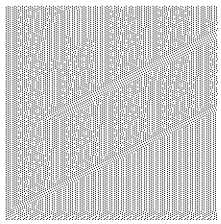
**MBU Blue**
4-MBU-30
LRV 10.59



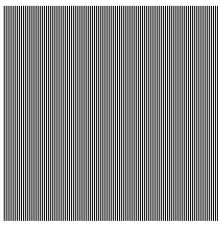
**HYB Blue**
4-HYB-30
LRV 4.20



**ABE Blue**
4-ABE-70
LRV 23.73



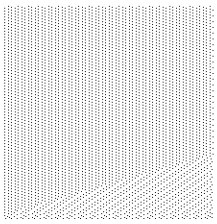
**AYW Yellow**
4-AYW-70
LRV 61.77



**TDR Green**
4-TDR-70
LRV 24.40

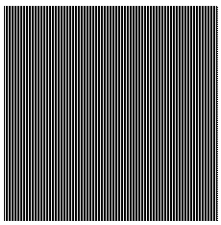
**RVW White**
4-RVW-50
LRV 86.34

**HWH White**
4-HWH-50
LRV 80.8

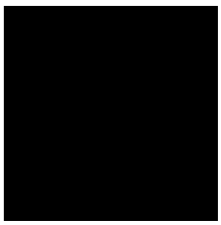


**COW White**
4-COW-30
LRV 68.67

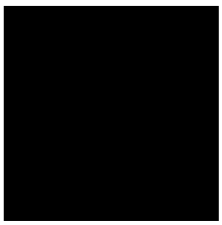
## MATTE



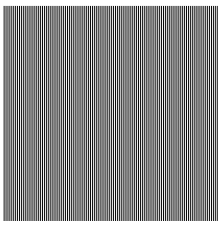
**CVG Grey**
4-CVG-50
LRV 14.38
3&4mm



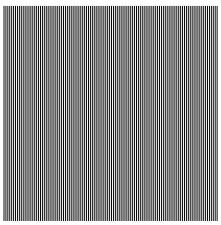
**BLX Black**
4-BLX-30
LRV 0.89
3&4mm



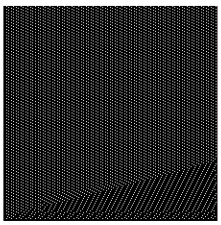
**TBL Black**
4-TBL-70
LRV 0.75
3&4mm



**RRM River Rock Grey**
4-RMM-6
LRV 23
SRI 17

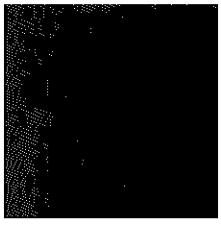


**TRM Terra Cotta**
4-TRM-6
LRV 17
SRI 16.9



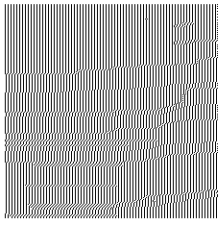
**BSM Slate Black**
4-BSM-6
LRV 5
SRI 1

## MICA

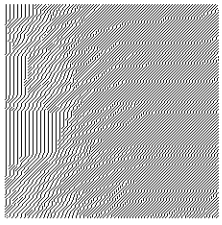


**MRO Anthracite Grey**
4-MRO-70
LRV 3.33

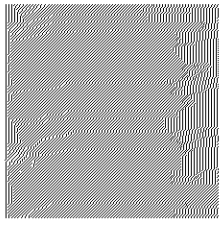
## METALLIC



**PEX Pewter Metallic**
4-PEX-30
LRV 20.63



**TSZ Silver Metallic**
4-TSZ-70
LRV 32.00



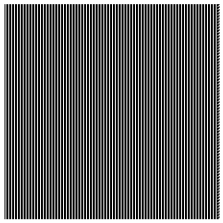
**TBX Silver Metallic**
4-TBX-30
LRV 38.75
3&4mm

*Colors shown are as close to actual colors as allowed by the printing process. Mitsubishi Chemical Composites America, Inc. reserves the right to change or delete information herein without prior notice. Please refer to warranty details for exclusions and limitations. Additional warranty coverage may be given to some projects/products. Please call 800.422.7370 for more information.

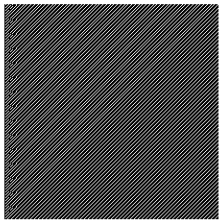
# 10 Year Finish Warranty Stock Colors

Stocked in 3mm unless otherwise stated

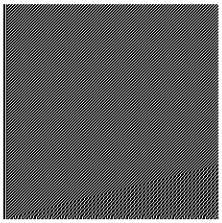
SOLID



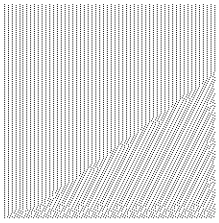
**STR Red**
3-STR-70
LRV 12.55



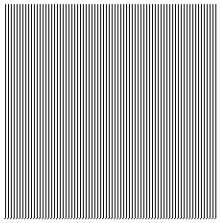
**TRD Red**
3-TRD-70
LRV 10.26



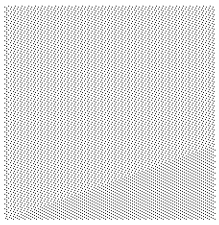
**FEF Red**
3-FEF-70
LRV 11.64



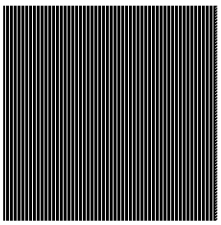
**BPS Pearl**
3-BPS-30
LRV 68.79



**ETT Tan**
3-ETT-30
LRV 47.87



**CRY Oyster**
3-CRY-50
LRV 72.30

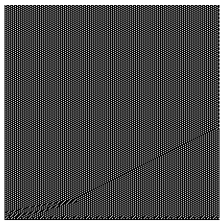


**MCV White**
3-MCV-70
LRV 68.21

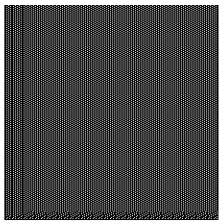
**SAW White**
3-SAW-70
LRV 80.62/3&4mm

**EWH White**
3-EWH-70
LRV 90.01

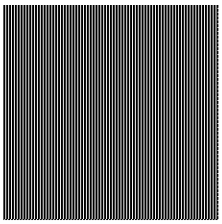
**DYB Blue**
3-DYB-50
LRV 10.06



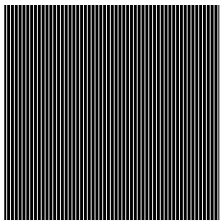
**CFB Blue**
3-CFB-70
LRV 7.24



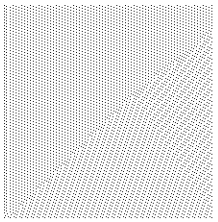
**SHB Blue**
3-SHB-70
LRV 4.12/3&4mm



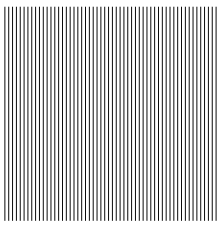
**BGN Green**
3-BGN-50
LRV 14.39



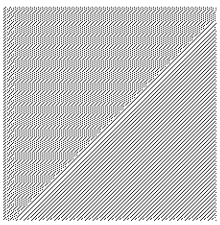
**GRV Green**
4-GRV-30
LRV 11.25



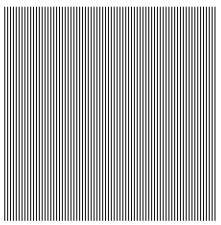
**BYL Yellow**
3-BYL-50
LRV 65.93



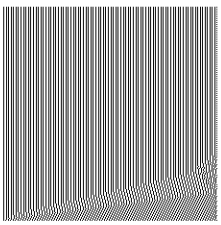
**EYL Yellow**
3-EYL-30
LRV 48.05



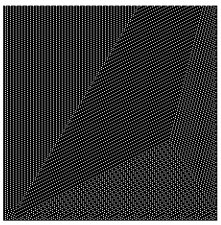
**YLW Yellow**
3-YLW-50
LRV 49.88



**SOG Grey**
3-SOG-70
LRV 49.50



**TXG Grey**
3-TXG-70
LRV 40.69

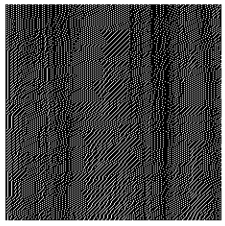


**SBR Bronze**
3-SBR-30
LRV 6.32

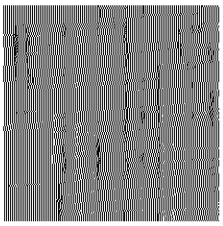
Order samples at www.alpolic-americas.com/samples

# Specialty Stock Colors/Finishes

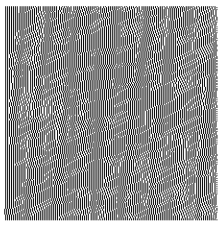
## TIMBER SERIES | 20 Year Finish Warranty | Call ALPOLIC® Customer Service for Warranty Details



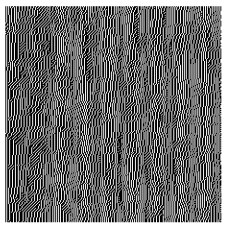
**QBB Teak**
4-QBB-30
LRV N/A



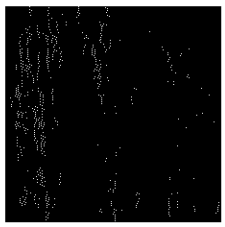
**QCP HT Bamboo**
4-QCP-30
LRV N/A



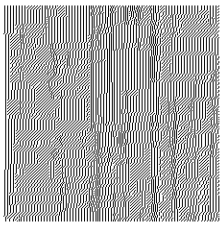
**MPL Maple**
4-MPL-30
LRV N/A



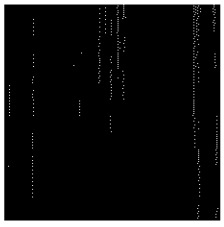
**WLN Walnut**
4-WLN-30
LRV N/A



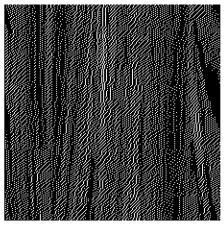
**QAE Mahogany**
4-QAE-30
LRV N/A



**QBV Oriental Cane**
4-QBV-30
LRV N/A

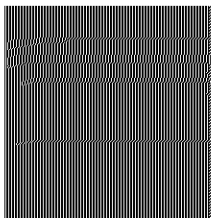


**QBT Zebrawood**
4-QBT-30
LRV N/A

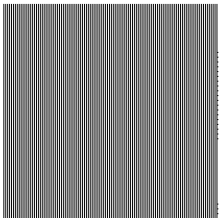


**QAW Rio Aleon**
4-QAW-30
LRV N/A

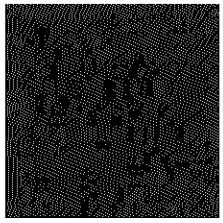
## EFFECTS SERIES | Call ALPOLIC® Customer Service for Warranty Details



**MRT Magma Prismatic**
3-MRT-70
LRV 11.33

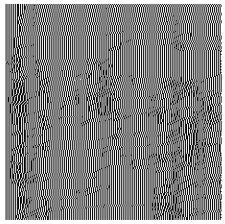


**DQO Orange Pearlescent**
3-DQO-70
LRV 22.21



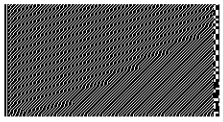
**DQS Maroon Gold Shimmer**
4-DQS-70
LRV 5.09
4mm only

## PATTERN | 20 Year Finish Warranty

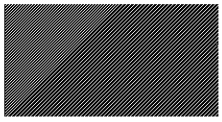


**QCO Rusted Steel**
4-QCO-20
LRV 16.17

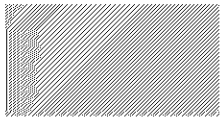
## MULTI-COLOR



**Red/White**
10 Year Finish Warranty
3-209-70
LRV 11.64
SRI 80.90



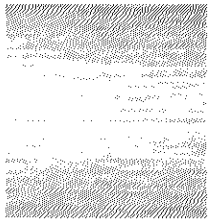
**Blue/White**
10 Year Finish Warranty
3-207-70
LRV 8.00
SRI 81.04



**Yellow/White**
10 Year Finish Warranty
3-234/238-35
LRV 48.05
SRI 90.01

## DECORATIVE

**HPA High Polished Aluminum**
5 Year Finish Warranty
3-HPA-70
LRV 0.88



**CLZ Aluminum**
20 Year Finish Warranty
4-CLZ-70
LRV 35.2

Order samples at www.alpolic-americas.com/samples

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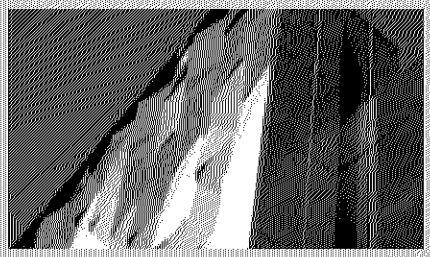

Lumiflon® FEVE, a remarkable second-generation fluoropolymer coating, meets the weatherability and chemical-resistance standards you would expect from PVDF finishes, but delivers unprecedented design and performance advantages – a rich palette of vivid colors, a full gloss range, excellent adhesion, recoatability and even ambient cure capabilities.

| | FEVE/Lumiflon® | PVDF/Kynar® |
|---|---|---|
| **Durability** | Meets AAMA 2605 | Meets AAMA 2605 |
| **Color Range** | Bright to Muted | Muted Only |
| **Color Retention** | Excellent | Excellent |
| **Gloss Range** | 10–70 | 10–40 |
| **Gloss Retention** | Excellent | Excellent |
| **Chalking Resistance** | Excellent | Excellent |
| **Field Touch-Up** | Excellent | Poor |
| **Marring Resistance** | Excellent | Good |

For additional information, samples or a list of ALPOLIC® fabricators, please call 1-800-422-7270 or visit www.alpolic-americas.com.

ALPOLIC®
METAL COMPOSITE MATERIALS

MITSUBISHI CHEMICAL COMPOSITES AMERICA, INC.

401 Volvo Parkway, Chesapeake, VA 23320
Telephone: 800-422-7270 | Fax: 757-436-1896
www.alpolic-americas.com | e-mail: info@alpolic.com



LITAP3000 Rev 19 A
OCT 2019

LUMIFLON
FEVE RESIN

A Group Company of
MITSUBISHI CHEMICAL

CASE #PL2019-40

# ALPOLIC Technical Summary

| | Property | Standard | Alpolic | | | | | unit |
|---|---|---|---|---|---|---|---|---|
| | | | PE | | | fr | | |
| | | | 3 mm | 4 mm | 6 mm | 4 mm | 6 mm | |
| Physical Properties | Aluminum Skin Thickness | | | | 0.02 | | | inch |
| | | | | | 0.5 | | | mm |
| | Weight | | 0.93 | 1.12 | 1.5 | 1.56 | 2.23 | lb/ft^2 |
| | | | 4.54 | 5.47 | 7.32 | 7.62 | 10.89 | kg/m^2 |
| | Sound Transmission Coefficient | ASTM E90 | 25 | 26 | 26 | — | — | dB |
| | Coefficient of Thermal Expansion | | | | 0.000013 | | | in/in-°F |
| | | | | | 0.0000234 | | | mm/mm-°C |
| | Drum Peel | ASTM D1781 | 33.6 | 33.6 | 33.6 | 27.6 | — | lb-in/in |
| | | | 150 | 150 | 123 | 110 | — | N-mm/mm |
| Fire Resistance Properties | Smoke Developed Index | ASTM E84 | 15 | 0 | 10 | 10 | 0 | — |
| | Flame Spread Index | ASTM E84 | 5 | 0 | 0 | 0 | 0 | — |
| | Flash Ignition Temperature | ASTM D1929 | — | 716 | 716 | 811 | 811 | °F |
| | | | — | 380 | 380 | 432.8 | 432.8 | °C |
| | Self Ignition Temperature | ASTM D1929 | — | 752 | 752 | 837 | 837 | °F |
| | | | — | 400 | 400 | 447.2 | 447.2 | °C |
| | Rate of Burning | ASTM D635 | — | CC1 | — | — | — | — |
| | ISMA Test | UBC 26-9 | — | — | — | Pass | Pass | — |
| | Potential Heat Release | UBC 17-2 | — | — | — | <6000 | — | BTU/ft^2 |
| | Other Fire Tests | ASTM E162 | — | 0 | — | 0 | — | — |
| | | ASTM E108 | Pass | Pass | Pass | Pass | Pass | — |
| | | ASTM E119 | — | — | — | Pass | — | — |
| | | UL-94 | V-O rating | V-O rating | — | — | — | — |
| | | UL-879 | Pass | Pass | — | — | — | — |
| | | NFPA-285 | — | — | — | Pass* | Pass* | — |
| Production Tolerances | Width | | | | 0.08 | | | inches |
| | | | | | 2 | | | mm |
| | Length | | | | 0.16 | | | inches |
| | | | | | 4 | | | mm |
| | Thickness | | 0.008 | | 0.012 | 0.008 | 0.012 | inches |
| | | | 0.2 | | 0.3 | 0.2 | 0.3 | mm |
| | Bow | | | | 0.5 | | | % |
| | Squareness (Diagonal Difference) | | | | 0.2 | | | inches |
| | | | | | 5 | | | mm |
| LEED | Post-Consumer Recycled Content | | 7.4 | 6.2 | 4.6 | 4.4 | 3.1 | % |
| | Pre-Consumer Recycled Content | | 58.4 | 57 | 55.25 | 22.7 | 15.9 | % |
| | Total = 100% Post + 50% Pre | | 36.6 | 34.7 | 32.2 | 15.76 | 11.1 | % |
| AAMA 2605** | 8.1 Color Uniformity | | | | Pass | | | — |
| | 8.2 Specular Gloss | | | | Pass | | | — |
| | 8.3 Dry Film Hardness | | | | Pass | | | — |
| | 8.4 Film Adhesion | | | | Pass | | | — |
| | 8.5 Impact Resistance | | | | Pass | | | — |
| | 8.6 Abrasion Resistance | | | | Pass | | | — |
| | 8.7 Chemical Resistance | | | | Pass | | | — |
| | 8.8 Corrosion Resistance | | | | Pass | | | — |
| | 8.9 Weathering | | | | Pass | | | — |
| Code Approvals | ICC-ES | | ESR-3704 | | | ESR-2653 | | — |
| | Florida | | FL10520-R3, FL12087-R2, FL17186-R2 | | | | | — |
| | Miami-Dade County | | 14-0610.01***, 14-0610.02*** | | | | | — |
| | City of LA | | 26029 | | | 26008 | | — |
| | Warnock Hersey | | — | | | Certified: ASTM E119; ASTM E84 (2013a); CAN / ULC S102; CAN / ULC S134; NFPA 285 | | — |

*NFPA 285 is a system test. Alpolic passed as a system component.

**ASTM Tests listed on following page

***number changes upon renewal.

| AAMA 2605 Section | Section Title | ASTM Test Referenced | Test Title |
|---|---|---|---|
| 5.3 | — | D7091-12 | Standard Practice for Nondestructive Measurement Of Dry Film Thickness Of Nonmagnetic Coatings Applied To Ferrous Metals And Nonmagnetic, Non Conductive Coatings Applied To Non-Ferrous Metals |
| 7.2.1 | Chemical Conversion Coating Weight Procedure | D5723-95(2010) | Standard Practice for Determination Of Chromium Treatment Weight On Metal Substrates By X-Ray Fluorescence |
| 8.1.2 | Color Uniformity Performance | D2244-11 | Standard Practice for Calculation Of Color Tolerances And Color Differences From Instrumentally Measured Color Coordinates |
| 8.2.1 | Specular Gloss Procedure | D523-08 | Standard Test Method for Specular Gloss |
| 8.3.1 | Dry Film Hardness Procedure | D3363-05(2011)e2 | Standard Test Method for Film Hardness By Pencil Test |
| 8.3.2 | Dry Film Hardness Performance | D3363-05(2011)e2 | Standard Test Method for Film Hardness By Pencil Test |
| 8.4.1.2 | Film Adhesion Procedure: Tape Pull-Off | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| 8.5.1 | Impact Resistance Procedure | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| 8.6.1 | Abrasion Resistance Procedure | D968-05(2010) | Standard Test Method for Abrasion Resistance Of Organic Coatings By Falling Abrasive |
| 8.7.2.1 | Chemical Resistance: Mortar Resistance Procedure | C207-06(2011) | Standard Specification for Hydrated Lime For Masonry Purposes |
| 8.7.3.2 | Chemical Resistance: Nitric Acid Resistance Performance | D2244-11 | Standard Practice for Calculation Of Color Tolerances And Color Differences From Instrumentally Measured Color Coordinates |
| 8.7.4.1 | Chemical Resistance: Detergent Resistance Procedure | D2248-01a(2007) | Standard Practice for Detergent Resistance Of Organic Finishes |
| 8.7.4.1 | Chemical Resistance: Detergent Resistance Procedure | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| 8.8.1.1 | Corrosion Resistance: Humidity Resistance Procedure | D2247-11 | Standard Practice for Testing Water Resistance Of Coatings In 100% Relative Humidity |
| 8.8.1.1 | Corrosion Resistance: Humidity Resistance Procedure | D4585-07 | Standard Practice for Testing Water Resistance Of Coatings Using Controlled Condensation |
| 8.8.1.2 | Corrosion Resistance: Humidity Resistance Performance | D714-02(2009) | Standard Test Method for Evaluating Degree Of Blistering Of Paints |
| 8.8.2.1 | Corrosion Resistance: Cyclic Corrosion Testing Procedure | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| 8.8.2.1 | Corrosion Resistance: Cyclic Corrosion Testing Procedure | G85-11 | Standard Practice for Modified Salt Spray (Fog) Testing |
| 8.8.2.2 | Corrosion Resistance: Cyclic Corrosion Testing Performance | D1654-08 | Standard Test Method for Evaluation Of Painted Or Coated Specimens Subjected To Corrosive Environments |
| 8.9.1.1 | Weathering: Testing Site and Duration | G7/G7M-13 | Standard Practice for Atmospheric Environmental Exposure Testing Of Nonmetallic Materials |
| 8.9.1.2.1 | Weathering: Color Retention Performance | D2244-11 | Standard Practice for Calculation Of Color Tolerances And Color Differences From Instrumentally Measured Color Coordinates |
| 8.9.1.3.1 | Weathering: Chalk Resistance Performance | D4214-07 | Standard Test Method for Evaluating The Degree Of Chalking Of Exterior Paint Film |
| 8.9.1.4.1 | Weathering: Gloss Retention Procedure | D523-08 | Standard Test Method for Specular Gloss |
| 8.9.1.5.1 | Weathering: Resistance to Erosion Procedure | B244-09 | Standard Test Method for Measurement Of Thickness Of Anodic Coatings On Aluminum Nonconductive Coatings On Nonmagnetic Basis Metals With Eddy Current Instruments |
| A3.1 | — | D7091-12 | Standard Practice for Nondestructive Measurement Of Dry Film Thickness Of Nonmagnetic Coatings Applied To Ferrous Metals And Nonmagnetic, Non Conductive Coatings Applied To Non-Ferrous Metals |
| A5.1.1.1 | T-Bend Test for Coating Flexibility | D4145-10 | Standard Test Method for Coating Flexibility Of Prepainted Sheet |
| A5.1.1.5 | T-Bend Test for Coating Flexibility | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| A5.2.1 | Impact Resistance: Direct Impact | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |
| A5.2.2 | Impact Resistance: Reverse Impact | D3359-09e2 | Standard Test Method for Measuring Adhesion By Tape Test |

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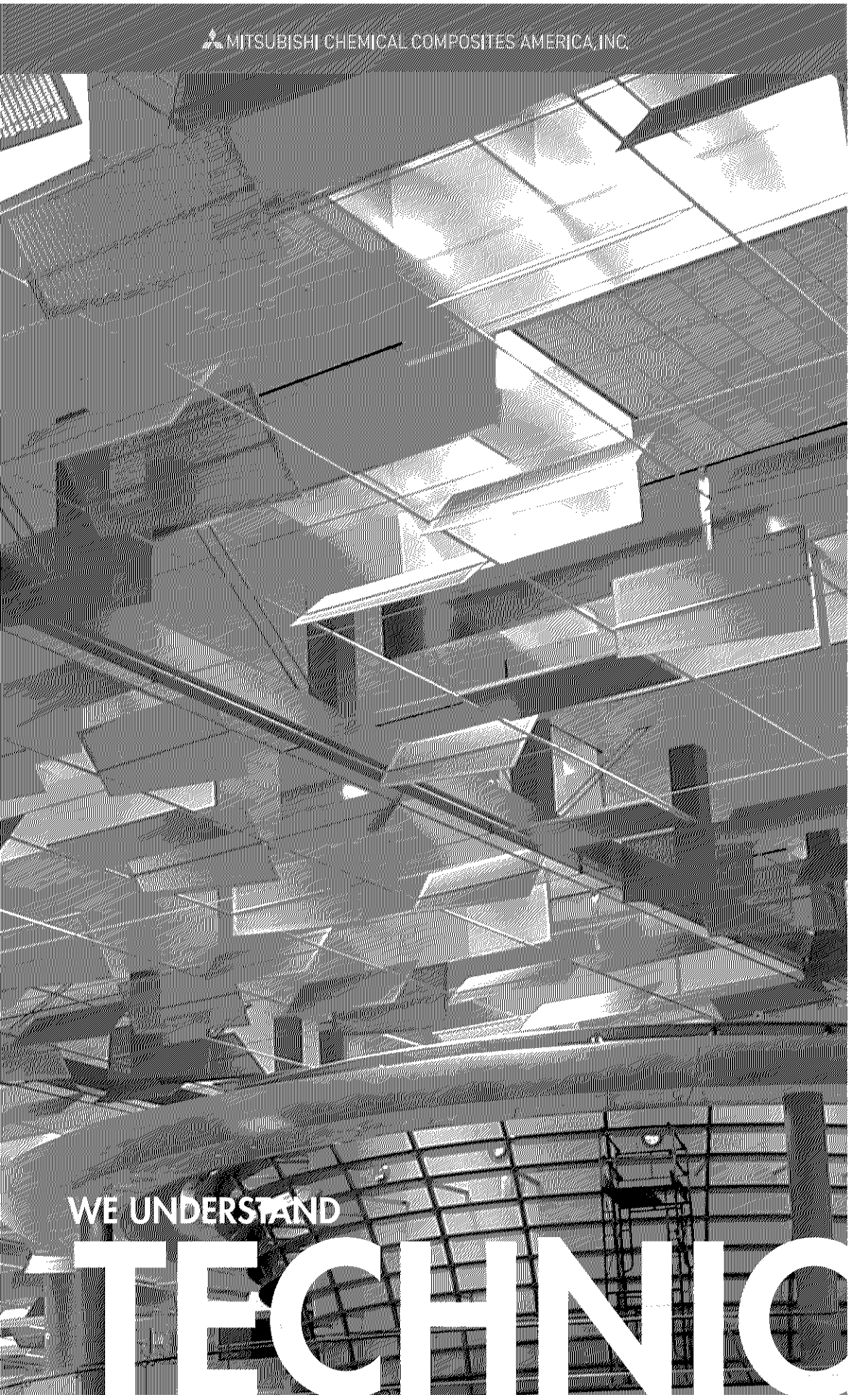

ALPOLIC®

METAL COMPOSITE MATERIALS

Your Design Perfected

WE UNDERSTAND

# TECHNICAL

TECHNICAL BROCHURE

# ALPOLIC®/PE TECHNICAL INFORMATION

## IMPACT RESISTANCE BY DUPONT METHOD

| | | ALPOLIC®/PE DENT DEPTH (x10⁻² IN) | | |
|---|---|---|---|---|
| STEEL BALL | HEIGHT | 3MM .118" | 4MM .157" | 6MM .236" |
| 1.10 lb | 20 in | 6.30 | 5.51 | 3.15 |
| 2.20 lb | 12 in | 7.87 | 6.69 | 3.93 |
| 2.20 lb | 20 in | 10.23 | 9.05 | 5.90 |

## BOND INTEGRITY

| | | | ALPOLIC®/PE TOTAL THICKNESS | | |
|---|---|---|---|---|---|
| PROPERTY | UNIT | ASTM | 3MM .118" | 4MM 157" | 6MM .236" |
| Vertical Pull | psi | C-297 | 1906 | 1806 | 1664 |
| Drum Peel | in-lb/in | D-1781 | 33.6 | 33.6 | 33.6 |
| Flatwise Shear | psi | C-273 | 1259 | 1225 | 1195 |

## ENGINEERING PROPERTIES

| | | | ALPOLIC®/PE TOTAL THICKNESS | | |
|---|---|---|---|---|---|
| PROPERTY | UNIT | ASTM | 3MM .118" | 4MM .157" | 6MM .236" |
| Aluminum Thickness | in | - | .020 | .020 | .020 |
| Specific Gravity | - | - | 1.52 | 1.38 | 1.23 |
| Weight | lbs/ft² | - | 0.93 | 1.12 | 1.50 |
| Coefficient of Expansion | in/in/°F | D-696 | $13x10^{-6}$ | $13x10^{-6}$ | $13x10^{-6}$ |
| Thermal Conductance | BTU/hr/°F/ft² | C-1363 | 12.29 | 10.75 | 8.53 |
| Tensile Yield Strength | psi | E-8 | 8321 | 6429 | 4466 |
| Tensile Strength | psi | E-8 | 8747 | 6913 | 4978 |
| Elongation | % | E-8 | 12.1 | 13.5 | 17.3 |
| Flexural Elasticity | psi | C-393 | $7110x10^3$ | $5770x10^3$ | $4220x10^3$ |
| Flexural Stiffness | psi | C-393 | $1.04x10^9$ | $1.99x10^9$ | $4.98x10^9$ |
| Punching Shear Resistance | | | | | |
| Maximum Load | lbs | D-732 | 1847 | 1920 | 2121 |
| Shear Resistance | psi | D-732 | 4950 | 4025 | 2816 |
| Deflection Temperature | °F | D-648 | 231.8 | 231.8 | 231.8 |
| Sound Transmission Coefficient | STC# | E-90 | 25 | 26 | 26 |

## SURFACE TREATMENTS

Standard ALPOLIC®/PE with a polyethylene core is available in the following finishes: FEVE (LUMIFLON™) with a wide color and gloss range and PVDF, both fluoropolymer finishes tested to meet AAMA 2605, polyester, and class 1 anodized. Other available ALPOLIC® finishes include Stone and Timber Series and Reflective Finishes (RF).

## STANDARD PANEL SIZES

| | |
|---|---|
| 50" x 146" | 62"x 146" |
| 50" x 196" | 62" x 196" |

## RANGE OF SIZES

Width 32.5"—62" (826mm – 1575mm)

Length 6'—24' 2" (1829mm – 7315mm)

## PRODUCT TOLERANCE

| | | |
|---|---|---|
| Width: | ± 0.08" (2mm) | |
| Length: | ± 0.16" (4mm) | |
| Thickness: | 3mm: | ± 0.008" (0.2mm) |
| | 4mm: | ± 0.008" (0.2mm) |
| | 6mm: | ± 0.012" (0.3mm) |
| Bow: | maximum 0.5% of length and/or width | |
| Squareness Maximum | 0.2" (5mm) | |

ALPOLIC®/PE material is trimmed and squared with cut edges to offer the best panel edge conditions in the industry

## FIRE PERFORMANCE

Standard ALPOLIC®/PE with a polyethylene core has been tested by independent testing laboratories using the following nationally recognized fire tests.

| | | |
|---|---|---|
| **ASTM E84** | | |
| Flame spread: | 3mm | 05 |
| | 4mm | 00 |
| | 6mm | 00 |
| Smoke developed: | 3mm | 15 |
| | 4mm | 00 |
| | 6mm | 10 |
| **ASTM E108 MODIFIED** | | |
| | 4mm | passed |
| | 6mm | passed |
| **ASTM D1929** | | |
| Flash: | 4mm | 716°F |
| Ignition: | 4mm | 752°F |
| **ASTM D635** | | |
| Rate of burning: | 4mm | Classified CC1 |
| **ASTM E162** | | |
| Flame spread: | 4mm | 0 |
| **UL-879** | | listed |
| **UL-94** | 3mm | V-O rating |

**CODE Evaluation Reports***

1. ICC ES
2. City of Los Angeles Report
3. Miami Dade Notice of Acceptance
4. Floridga Building Code Approval
5. UL Approved

*Reports are available at:
www.alpolic-americas.com/documents

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# ALPOLIC®/fr TECHNICAL INFORMATION

## IMPACT RESISTANCE BY DUPONT METHOD

ALPOLIC®/fr

DENT DEPTH (x10$^{-2}$ IN)

| STEEL BALL | HEIGHT | 4MM .157" | 6MM .236" |
|---|---|---|---|
| 1.10 lb | 20 in | 5.07 | 3.93 |
| 2.20 lb | 12 in | 5.47 | 4.72 |
| 2.20 lb | 20 in | 7.40 | 6.30 |

## BOND INTEGRITY

ALPOLIC®/fr

TOTAL THICKNESS

| PROPERTY | HEIGHT | ASTM | 4MM .157" |
|---|---|---|---|
| Vertical Pull | psi | C-297 | 427 |
| Drum Peel | in-lb/in | D-1781 | 27.6 |
| Flatwise Shear | psi | C-273 | 949 |

## ENGINEERING PROPERTIES

ALPOLIC®/fr

TOTAL THICKNESS

| PROPERTY | UNIT | ASTM | 4MM .157" | 6MM .236" |
|---|---|---|---|---|
| Aluminum Thickness | in | - | .020 | .020 |
| Specific Gravity | - | - | 1.90 | 1.81 |
| Weight | lbs/ft$^2$ | - | 1.56 | 2.23 |
| Coefficient of Expansion | in/in/°F | D-696 | 13x10$^{-6}$ | 13x10$^{-6}$ |
| Tensile Yield Strength | psi | E-8 | 6344 | 3840 |
| Tensile Strength | psi | E-8 | 7126 | 4266 |
| Elongation | % | E-8 | 5.0 | 2.0 |
| Flexural Elasticity | psi | C-393 | 5770x10$^3$ | 4220x10$^3$ |
| Flexural Stiffness | psi | C-393 | 1.93x10$^9$ | 4.98x10$^9$ |
| Punching Shear Resistance | | | | |
| Maximum Load | lbs | D-732 | 2259 | --- |
| Shear Resistance | psi | D-732 | 4637 | --- |
| Deflection Temperature | °F | D-648 | 241.8 | 228.8 |

## SURFACE TREATMENTS

ALPOLIC ®/fr (fire-retardant) with a mineral filled core offers the same flatness, rigidity, workability, formability and quality features of standard ALPOLIC®/PE. ALPOLIC®/fr is curvable to a 6" radius and can be joined with hot melt adhesive to form complex shapes. In addition, ALPOLIC®/fr is available in the same full palette of bright, clean colors and gloss ranges as standard ALPOLIC ®/PE, as well as Stone Series, Anodized and Natural Metals. Extensive fire performance laboratory testing by independent testing agencies in accordance with requirements set forth by IBC has established ALPOLIC®/fr approval on Type 1, 2, 3, 4 and 5 Construction throughout the United States and Canada when used as a wall cladding material.

## FIRE PERFORMANCE

ALPOLIC®/fr (fire-retardant) has been tested by independent testing laboratories using the following nationally recognized fire tests.

| | | |
|---|---|---|
| **ASTM E84** | | |
| Flame spread: | 4mm | 00 |
| Smoke Developed: | 4mm | 10 |
| Flame spread: | 6mm | 00 |
| Flame spread: | 6mm | 00 |
| **ASTM E162** | | |
| Flame Spread: | 4mm | 0 |
| **ASTM E108 MODIFIED** | | Passed |
| **ASTM 1929** | | |
| Flash: | 4mm | 811°F |
| Ignition: | 4mm | 837°F |

## NFPA 285, INTERMEDIATE SCALE MULTI STORY APPARATUS TEST:

| | | |
|---|---|---|
| | 4mm | passed |
| | 6mm | passed |
| **ASTM E119** | | |
| | 4mm | passed |
| **CAN/ULC S 134M** | | |
| | 4mm | passed |
| **NFPA 259, POTENTIAL HEAT RELEASE** | | |
| | 4mm | <6000 BTU/ft$^2$ |

## COMBUSTION GAS TOXICITY PER UNIVERSITY OF PITTSBURGH

"No more toxic than wood."

## CODE EVALUATION REPORTS*

1. ICC ES
2. City of Los Angeles Report
3. Miami Dade Notice of Acceptance
4. Floridga Building Code Approval
5. CAN/ULC S102 & S134
6. ASTM E84 & E119
7. NFPA 285

*Reports are available at:
www.alpolic-americas.com/documents

CASE #PL2019-40

MITSUBISHI CHEMICAL COMPOSITES AMERICA, INC.

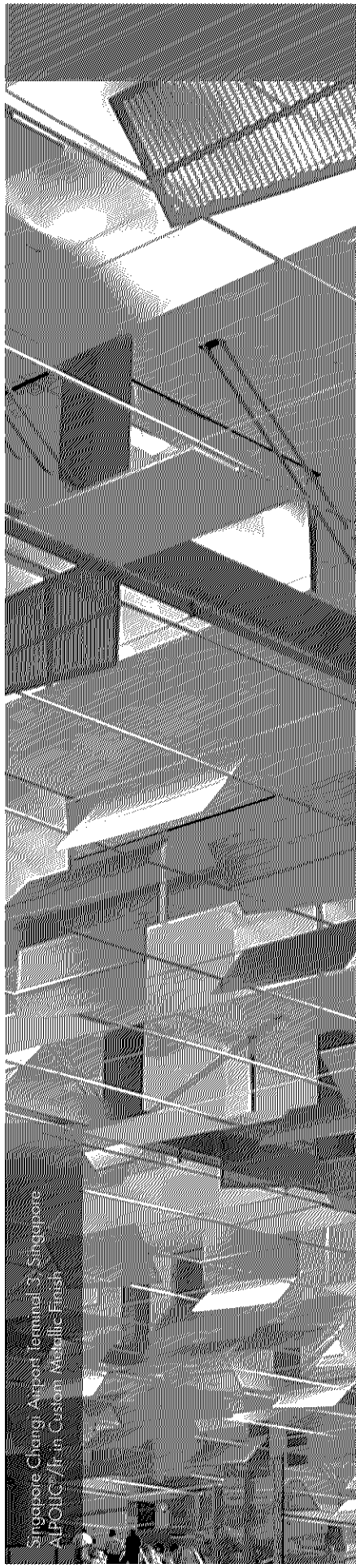


# EFFECTUAL

Let us know how we can help you make your design idea a reality. Get more information, order finish samples and find a fabricator by calling 1-800-422-7270 or visiting alpolic-americas.com.

ALPOLIC®
METAL COMPOSITE MATERIALS

Your Design **Perfected**




LITAP4000 REV B: September 2018

A Group Company of
MITSUBISHI CHEMICAL

THE KAITEKI COMPANY
Mitsubishi Chemical Holdings Group

LUMIFLON™
FEVE RESIN

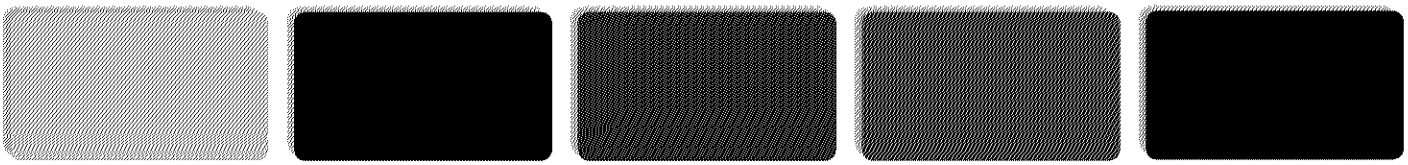
# metal sales™ manufacturing corporation — Color Guide

## PVDF Paint System

REFER TO SUBMITTALS 074213-001 AND 074213-002 FOR APPROVED COLORS

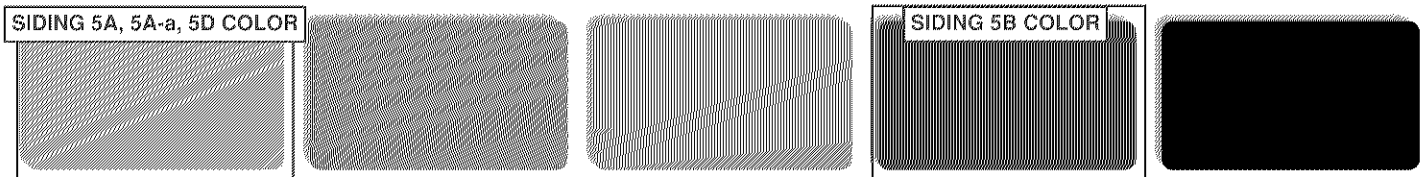
SUBMITTAL FOR SIDINGS 5A (EM1-1212), 5A-a (TL-17), 5B (SOFFIT FLAT PAN), 5D (EM1-1212)

Snowdrift White (W81) | Linen White (81) | Sandstone (W51) | Parchment (W74) | Taupe (74)



Khaki (88) | Medium Bronze (H4) | Weathered Copper (W50) | Mansard Brown (133) | Dark Bronze (50)

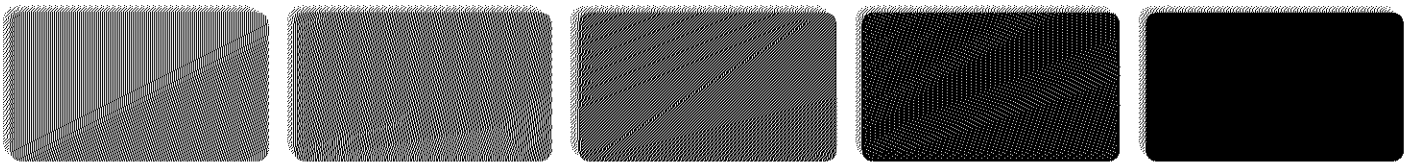
SIDING 5A, 5A-a, 5D COLOR



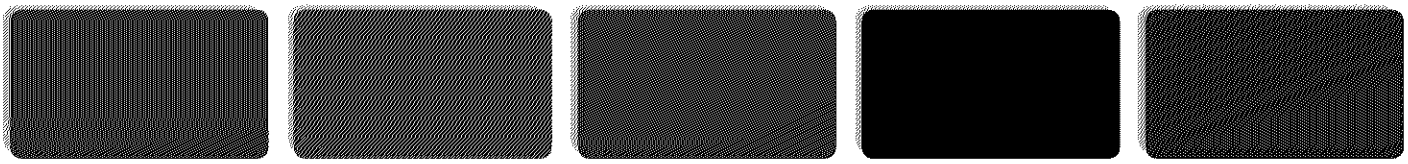
Ash Grey (25) | Old Town Grey (W25) | Old Zinc Grey (W29)

SIDING 5B COLOR

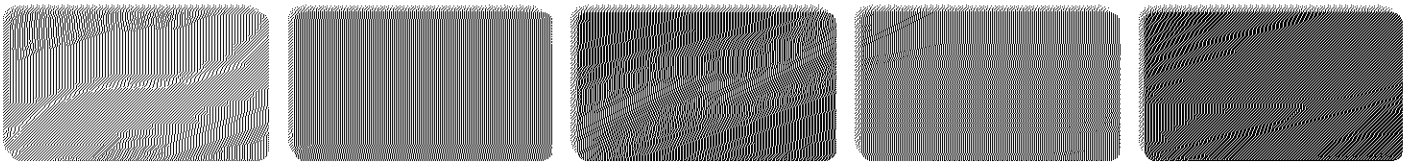
Slate Grey (W38) | Matte Black (106)



Aged Copper (65) | Patina Green (W58) | Hemlock Green (M7) | Classic Green (66) | Felt Green (W66)



Patriot Red (73) | Terra Cotta (W72) | Colonial Red (W75) | Brandywine (P8) | River Teal (59)



Metallic Silver (K7)[1] | Champagne Metallic (168)[1] | Mistique Plus (W31)[1] | Copper Penny (W92)[1] | Antique Patina (M1)[1]

Tahoe Blue (W71) | Ocean Blue (35) | Regal Blue (W35)

**Galvalume® (41)**
*Non-painted Finish*
*25 Year Warranty*

CRRC RATED PRODUCT — ENERGY STAR PARTNER

All Colors Meet or Exceed ENERGY STAR® Steep Slope Requirements

[1] Metallic Colors, up-charge will apply

**Visit metalsales.us.com for valuable tools and resources.**

## 45 Year Paint Warranty

All colors carry a 45 year limited paint warranty.
Color selections are close representations but are limited by printing and viewing conditions. Actual samples are available by request.

Weis Builders, Inc.
SUBMITTAL\SHOP DRAWING

☐ Reviewed ☒ Reviewed As Noted ☐ Revise and Resubmit

5/15/2020

This review is only for general conformance with the contract documents. Subcontractor or supplier is responsible for specific compliance with plans and specifications.

By: Scott Nelson

24 GAUGE

| PVDF Color Name (Color Code) | Solar Reflectance ASTM C 1549 | Thermal Emittance ASTM C 1371 | Solar Reflectance Index ASTM E 1980 | Low Gloss | Metallic Finish | ENERGY STAR® Steep Slope* | ENERGY STAR® Low Slope* | CRRC Steep Slope* | CRRC Low Slope* | LEED Steep Slope* | LEED Low Slope* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aged Copper (65) | 0.32 | 0.85 | 32 | | | ● | | ● | | ● | |
| Antique Patina (M1) | 0.38 | 0.85 | 40 | | ● | ● | | ● | | ● | |
| Ash Grey (25) | 0.38 | 0.86 | 41 | | | ● | | ● | | ● | |
| Brandywine (P8) | 0.26 | 0.85 | 24 | | | ● | | ● | | | |
| Champagne Metallic (168) | 0.47 | 0.85 | 53 | | ● | ● | | ● | | ● | |
| Classic Green (66) | 0.32 | 0.86 | 33 | | | ● | | ● | | ● | |
| Colonial Red (W75) | 0.35 | 0.86 | 37 | ● | | ● | | ● | | ● | |
| Copper Penny (W92) | 0.45 | 0.85 | 50 | | ● | ● | | ● | | ● | |
| Dark Bronze (50) | 0.30 | 0.86 | 30 | | | ● | | ● | | ● | |
| Felt Green (W66) | 0.31 | 0.84 | 31 | ● | | ● | | ● | | ● | |
| Galvalume® (41) | 0.67 | 0.14 | 56 | | ● | ● | | | | ● | |
| Hemlock Green (M7) | 0.36 | 0.85 | 38 | ● | | ● | | ● | | ● | |
| Khaki (88) | 0.35 | 0.87 | 37 | | | ● | | ● | | ● | |
| Linen White (81) | 0.73 | 0.86 | 89 | | | ● | ● | ● | ● | ● | ● |
| Mansard Brown (133) | 0.30 | 0.87 | 31 | | | ● | | ● | | ● | |
| Matte Black (106) | 0.27 | 0.86 | 26 | | | ● | | ● | | | |
| Medium Bronze (H4) | 0.30 | 0.87 | 31 | | | ● | | ● | | ● | |
| Metallic Silver (K7) | 0.60 | 0.77 | 68 | | ● | ● | | ● | | ● | |
| Mistique Plus (W31) | 0.34 | 0.82 | 34 | | ● | ● | | ● | | ● | |
| Ocean Blue (35) | 0.29 | 0.86 | 29 | | | ● | | ● | | ● | |
| Old Town Grey (W25) | 0.40 | 0.85 | 43 | ● | | ● | | ● | | ● | |
| Old Zinc Grey (W29) | 0.42 | 0.85 | 46 | ● | | ● | | ● | | ● | |
| Parchment (W74) | 0.41 | 0.86 | 45 | ● | | ● | | ● | | ● | |
| Patina Green (W58) | 0.46 | 0.85 | 51 | ● | | ● | | ● | | ● | |
| Patriot Red (73) | 0.46 | 0.86 | 52 | | | ● | | ● | | ● | |
| Regal Blue (W35) | 0.27 | 0.86 | 26 | ● | | ● | | ● | | | |
| River Teal (59) | 0.29 | 0.86 | 29 | | | ● | | ● | | ● | |
| Sandstone (W51) | 0.54 | 0.86 | 63 | | | ● | | ● | | ● | |
| Slate Grey (W38) | 0.30 | 0.85 | 30 | ● | | ● | | ● | | ● | |
| Snowdrift White (W81) | 0.65 | 0.85 | 78 | ● | | ● | ● | ● | | ● | ● |
| Tahoe Blue (W71) | 0.30 | 0.86 | 30 | ● | | ● | | ● | | ● | |
| Taupe (74) | 0.29 | 0.84 | 28 | | | ● | | ● | | | |
| Terra Cotta (W72) | 0.39 | 0.85 | 42 | ● | | ● | | ● | | ● | |
| Weathered Copper (W50) | 0.32 | 0.84 | 32 | ● | | ● | | ● | | ● | |

*LOW SLOPE: Surface with a slope of 2:12 or less ● STEEP SLOPE: Surface with a slope greater than 2:12



## Metal Sales Branch Locations

metalsales.us.com

Anchorage, AK: 866.640.7663
Bay City, MI: 888.777.7640
Deer Lake, PA: 800.544.2577
Denver, CO: 800.289.7663
Detroit Lakes, MN: 888.594.1394
Fontana, CA: 800.782.7953
Fort Smith, AR: 877.452.3915
Independence, MO: 800.747.0012
Jacksonville, FL: 800.394.4419
Jefferson, OH: 800.321.5833
Mocksville, NC: 800.228.6119
Nashville, TN: 800.251.8508
Rock Island, IL: 800.747.1206
Rogers, MN: 800.328.9316
Seattle, WA: 800.431.3470
Sellersburg, IN: 800.999.7777
Sioux Falls, SD: 888.299.0024
Spokane, WA: 800.572.6565
Temple, TX: 800.543.4415
Woodland, CA: 800.759.6019

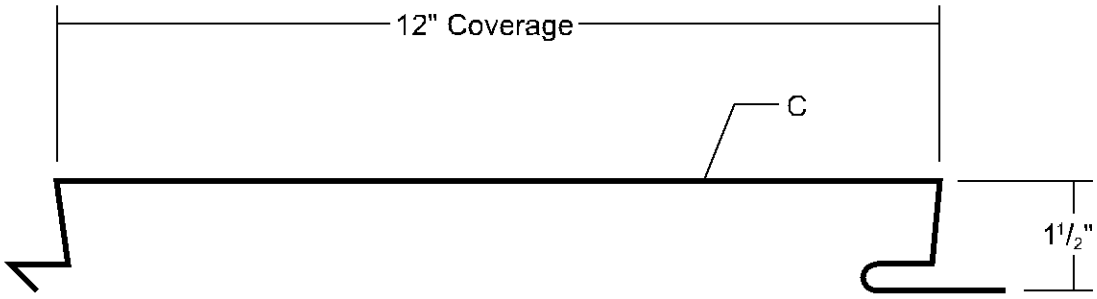
# TL-17 PANEL

SIDING 5A-a

Condensed Technical Reference

WALL PANEL

CASE #PL2019-40




ARCHITECTURAL COMMERCIAL INDUSTRIAL PANEL

CONCEALED FASTENED

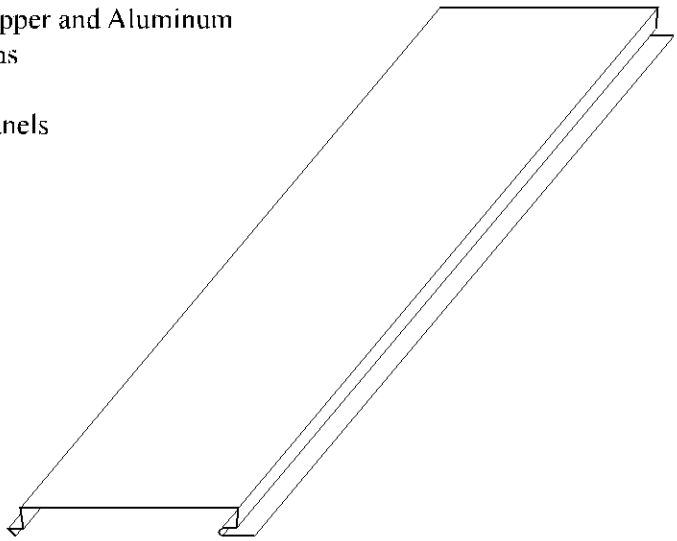
12" COVERAGE

SOFFIT, FASCIA, WALL AND LINER PANEL

OPEN FRAMING OR SOLID SUBSTRATE

## PANEL OVERVIEW

- Finish: Standard: PVDF
  Optional: multi-pass Kynar 500®, Marblique, Plastisol, Polyester and MS Colorfast45®
- Corrosion Protection: AZ50 per ASTM A 792 for painted Galvalume®
  G90 per ASTM A 653 for Galvanized
- Gauges: 24 ga, 22 ga, 20 ga and 18 ga
- 12" panel coverage, 1 1/2" panel height
- Flush face, concealed fastened, non-end lapping panel system
- Panel Length: 5' minimum, 30' maximum
- Optional material availability: Stainless Steel, Copper and Aluminum
- Use on single-skin or field-assembled wall systems
- Custom capabilities include:
  -Perforated panels for wind screens and liner panels



## TESTING AND APPROVALS

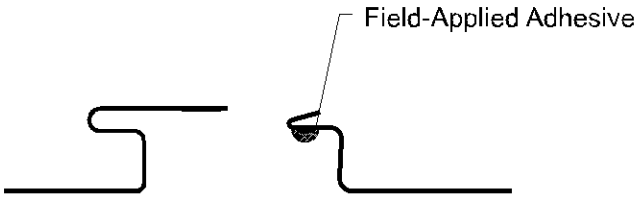
- UL 263 Fire Resistance Rating - per assembly
- ASTM E 283 Air Leakage
- ASTM E 331 Water Penetration
- ASTM E 330 Uniform Static Air Pressure Difference
- ASTM E 1592 Uniform Static Air Pressure Difference

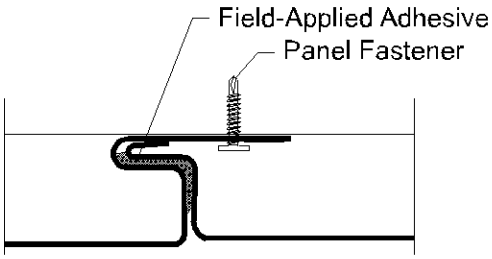
MS metal sales™ manufacturing corporation

# TL-17 PANEL

Condensed Technical Reference

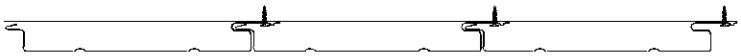
## ATTACHMENT DETAILS



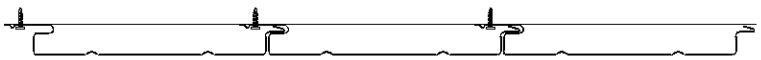




## DIRECTIONAL DETAILS

**Left to Right Installation**



**Right to Left Installation**



## FASTENING INFORMATION

Overdriven fasteners will cause panel distortions.

Fasteners should extend 1/2" or more past the inside face of the support material.

Thick Panels (ex. 18 ga) or supports (ex. 1/2" steel) may require predrilling of holes for screws.

Panel Fasteners:
- Attaching to Wood:
  - #10-12 Pancake Head Wood Screw
- Attaching to Steel:
  - <18 ga: 1/4"-13 Deck Screw
  - >=18 ga, <=12 ga: #10-16 Pancake Head Driller

Trim Fasteners:
- 1/4"-14 x 7/8" XL Stitch Screw
- 1/8" x 3/16" Pop Rivet

Field-Applied Adhesive:
- 3/8" bead of SM7108

## SECTION PROPERTIES

## ALLOWABLE UNIFORM LOADS, psf For various fastener spacings

| Ga | Width in | Yield ksi | Weight psf | Top In Compression | | Bottom In Compression | | Inward Load | | | | | | Outward Load | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Ixx in⁴/ft | Sxx in³/ft | Ixx in⁴/ft | Sxx in³/ft | 2' | 3' | 4' | 5' | 6' | 8' | 2' | 3' | 4' | 5' | 6' | 8' |
| **24** | 12 | 50 | 1.34 | 0.0495 | 0.0562 | 0.0746 | 0.0597 | 50 | 45 | 39 | 34 | 28 | 18 | 81 | 71 | 62 | 51 | 36 | 20 |
| **22** | 12 | 50 | 1.76 | 0.0714 | 0.0847 | 0.1014 | 0.0811 | 63 | 56 | 50 | 44 | 38 | 25 | 83 | 74 | 65 | 56 | 48 | 30 |
| **20** | 12 | 33 | 2.15 | 0.1017 | 0.1314 | 0.1328 | 0.1071 | 63 | 56 | 50 | 44 | 38 | 25 | 83 | 74 | 65 | 56 | 48 | 30 |
| **18** | 12 | 33 | 2.82 | 0.1530 | 0.1851 | 0.1840 | 0.1486 | 63 | 56 | 50 | 44 | 38 | 25 | 83 | 74 | 65 | 56 | 48 | 30 |

1. Theoretical section properties have been calculated per AISI 2012 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable loads are calculated in accordance with AISI 2012 specifications considering bending, shear, combined bending, shear and deflection and panel testing per ASTM E 1592 over 16 ga support and field-applied adhesive as shown above. Allowable loads consider the 3 or more equal spans condition. Allowable loads do not address web crippling, fasteners or support material. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase for wind.



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Fontana, CA 800.782.7953
Fort Smith, AR 877.452.3915
Independence, MO 800.747.0012
Jacksonville, FL 800.394.4419
Jefferson, OH 800.321.5833
Mocksville, NC 800.228.6119
Nashville, TN 800.251.8508
Rock Island, IL 800.747.1206
Rogers, MN 800.328.9316
Seattle, WA 800.431.3470
Sellersburg, IN 800.999.7777
Sioux Falls, SD 888.902.8320
Spokane, WA 800.572.6565
Temple, TX 800.543.4415
Woodland, CA 800.759.6019

metal sales manufacturing corporation

# SPECIFICATION DATA

## Metal Sales Manufacturing Corporation

This specification data sheet is provided by Metal Sales Manufacturing Corporation as a technical support tool incident to the sale of its Concealed Fastened Wall Panel products. Contact Metal Sales for more information on these and other products.
Telephone: 800.406.7387
metalsales.us.com

Section 07 42 13 - METAL WALL PANELS

### 1. PRODUCT NAMES

Empire Series™: EM1-1212, EM1-1653, EM15-126, EM15-168, EM15-1266, EM15-1275, EM-1284 and EM15-1293 metal wall panels.

### 2. MANUFACTURER

Metal Sales Manufacturing Corporation
545 South 3rd Street, Suite 200
Louisville, KY 40202
Toll Free: 800.406.7387
Phone: 502.855.4300
Fax: 502.855.4200
Web: metalsales.us.com
E-Mail: rgage@metalsales.us.com

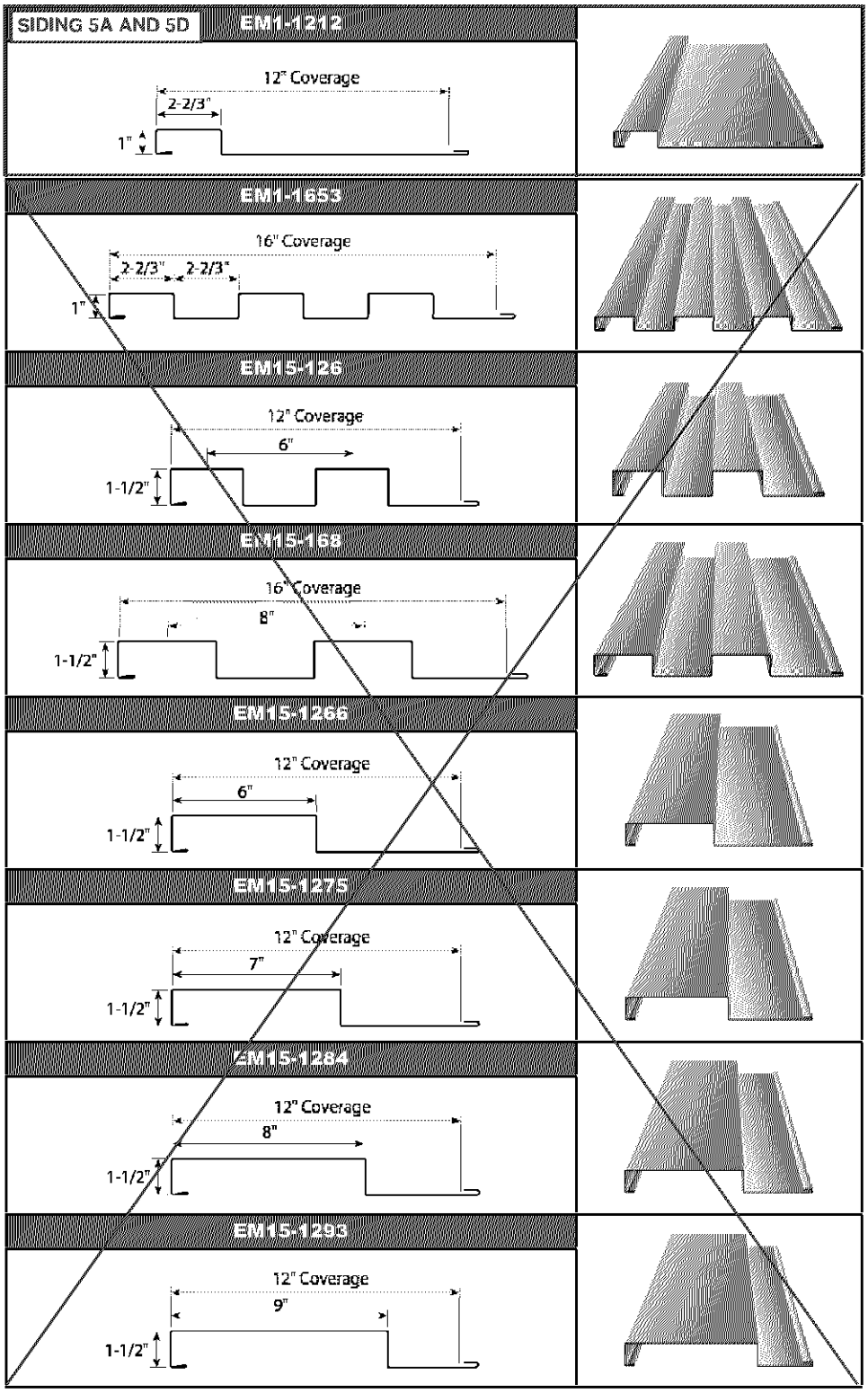
### 3. PRODUCT DESCRIPTION

**Basic Use**

For more than 55 years, Metal Sales has earned a reputation as the premier provider of metal building components and accessories. Metal Sales maintains the industry's largest professional sales and service team, supported by 21 branches located throughout the United States and offers a full line of high quality metal roof and wall panels for agricultural, commercial, architectural, industrial and residential projects of every shape and size for both new construction and retrofit applications. Metal Sales is dedicated to leading the metal building component industry, by setting new standards for operating efficiency, product design, active service management and lasting value.

**Manufacturer Memberships and Affiliations**

CRRC - Cool Roof Rating Council
MCA - Metal Construction Association
CSI - Construction Specifications Institute
NRCA - National Roofing Contractors Association
ILFI - International Living Future Institute
ENERGY STAR® Partner



metal sales™ manufacturing corporation

# SPECIFICATION DATA

## 4. TECHNICAL DATA

**Applicable Standards**

- ASTM E 283 - Standard Test Method for Determining rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across Specimen.
- ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference.
- ASTM A 792 - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
- ASTM D 2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
- ASTM D 4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.

**Underwriters Laboratories (UL):**

- UL 263 - Fire Tests of Building Construction and Materials.

**Physical Properties:**
Test reports are available to design professionals upon request.
Note: Industry designation for material thickness is moving away from "gauge" to decimal thickness in inches. Metal Sales recommends use of a minimum thickness requirement of 0.0236-inch (0.60-mm) instead of 24 gauge and 0.0296-inch (0.75-mm) instead of 22 gauge. Select AZ50 for painted material or AZ55 for unpainted material. Grade 50 applies to 24 and 22 gauge material.

**Technical Properties for Empire Series™ EM1-1212, EM1-1653, EM15-126, EM15-168, EM15-1266, EM15-1275, EM15-1284 and EM15-1293 Products:**
►Panel Coverage: 12 inches (304.8 mm) or 16 inches (406.4 mm).
►Panel Depth: 1 inch (25.4 mm) or 1.5 inches (38.1 mm).
►Attachment: Concealed clip.
►Material: Aluminum-zinc alloy-coated steel sheet, ASTM A 792, AZ50 or AZ55 coating designation, structural quality, Grade 50, 0.0236-inch (0.60-mm) or 0.0296-inch (0.75-mm) minimum thickness.
►Application: Designed for application over open framing or solid substrate.
►Rib Configuration: Box.
►Perforation: Optional.
►Surface Finish: PVDF (Kynar 500), Multi-pass Kynar 500, Marblique, Plastisol or Weathering Steel.
►Color: Select from manufacturer's standard colors.
►Testing: Fire Resistance Rating: Complies with UL 263, depending on assembly.

**Environmental Considerations**
Construction metals generally are readily recyclable at the end of their service life. The raw materials used in manufacture of metal wall panels also come from recycled sources. Pre-consumer and post-consumer recycled content varies. Consult with manufacturer for more information.

**Fire Performance**
Flame-Spread Index: 25 or less (Class A).
Smoke-Developed Index: 450 or less.

## 5. INSTALLATION

**Handling and Storage**
Handle and store product according to Metal Sales recommendations. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Store materials above ground, under waterproof covering, protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Provide proper ventilation of metal panel system to prevent condensation build-up between each panel and trim or flashing component. Tilt stack to drain in wet conditions. Remove strippable plastic film before storage under high-heat conditions. Store products in manufacturer's unopened packaging until just prior to installation. Exercise caution in unloading and handling metal panel system to prevent bending, warping, twisting and surface damage.

**Typical Assemblies**
-Wood sheathing on stud framing with moisture barrier
-Wood sheathing on girt framing with moisture barrier
-Metal deck on framing with rigid insulation and moisture barrier

**Preparation**
Install substrate boards over deck and sheathing over entire surface using recommended fasteners. Anchor metal panels to supports according to metal panel manufacturer's recommendations. Ensure panel supports are plumb and in-plane. Limit in-plane variance to no more than a total of 1/4" on 10'-0".

**Underlayment Installation**
Install self-adhering sheet underlayment and felt underlayment as required. Install flashing in com-

pliance with requirements in Division 07 Section "Sheet Metal Flashing and Trim" and Metal Sales recommendations.

**Thermal Insulation Installation**
Install polyethylene vapor retarder if required. Install board insulation if required, in compliance with installation requirements in Division 07 Section "Thermal Insulation" requirements. Install blanket insulation if required, in compliance with installation requirements in Division 07 Section "Thermal Insulation."

**Metal Wall Panel Installation**
Verify that site conditions are acceptable for installation. Do not proceed with installation until unacceptable conditions are corrected. Comply with panel manufacturer's installation instructions including but not limited to special techniques, interface with other work and integration of systems. Fasten metal wall panels to supports with concealed clips at each side-seam joint location, spacing and using proper fasteners as recommended by panel manufacturer. Comply with installation tolerances as required.

**Accessory Installation**
Install accessories using techniques recommended by manufacturer and which will assure positive anchorage to building and weather tight mounting. Provide for thermal movement. Coordinate installation with flashings and other components. For Flashing and Trim, comply with performance requirements, manufacturer's written installation instructions and the SMACNA "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and install units to true level and plumb. Install work with moisture barrier, laps, joints and seams that will be permanently watertight.

**Field Quality Control**
If requested by Owner, provide manufacturer's field service consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

**Precautions, Cleaning and Protection**
Touch-up paint is used to cover and protect unexpected scratches on the paint finish that may occur during installation of panel. Touch-up paint will not weather as well or at the same rate as the original system. Test in an area that will not be noticeable. Metallic paint colors are available at an additional charge. Minor differences in color and appearance are normal and to be expected.
To minimize possible differences in appearance, an entire project should be painted at one time, from one batch of paint, using the same application equipment. Additionally, fabricated panels, flat sheet and flashings should be oriented in the same direction.
After installation remove temporary coverings and protection of adjacent work areas. Repair or replace any installed products that have been damaged. Clean installed panels in accordance with manufacturer's instructions prior to Owner's acceptance. Remove and lawfully dispose of construction debris from Project site. Protect installed product and finish surfaces from damage during construction.

**Building Codes**
Current data on building code requirements and product compliance may be obtained from Metal Sales technical support specialists. Installation must comply with the requirements of authority having jurisdiction.

## 6. AVAILABILITY AND COST

**Availability**
Metal Sales products are nationally distributed and supported from 21 convenient locations nationwide, including Alaska. Manufacturer has the ability to ship worldwide. Contact manufacturer for information on local availability.

**Cost**
Budget installed cost information may be obtained from a local Metal Sales distributor or directly from the manufacturer.

## 7. WARRANTY

**Weather Tightness Warranty**
Metal Sales Weather Tightness Warranties are available in several forms. Request sample warranty documents from manufacturer for review and editing assistance. Metal Sales warranty excludes failure due to physical damage and surface deterioration due to exposure to salt air environments. Warranty Period is optionally 5, 10 or 20 years.

Type 2 Warranty:
Trim and side-lap warranty, with dollar limit.

Type 4 Warranty:
Trim and side-lap warranty, with no dollar limit.

**Paint Finish Warranty**
Metal Sales' standard PVDF (Kynar 500®) Fluorocarbon System Warranty for film integrity, chalk rating and fade rating in which manufacturer agrees to repair or replace panels that show evidence of deterioration within specified warranty period. Deterioration shall include, but is not limited to, color fading of more than 5 Hunter units when tested according to ASTM D 2244, chalking in excess of a No. 8 rating when tested according to ASTM D 4214 or cracking, checking, peeling or failure of paint to adhere to bare metal. Warranty Period for film integrity is 45 years and for chalk and fade rating is 35 years. Metal Sales warranty excludes surface deterioration due to physical damage and exposure to salt air environments.

## 8. MAINTENANCE

No specific maintenance is required for properly installed Metal Sales concealed-fastened wall panel products. Periodic inspection to verify system integrity, drainage functionality and repair of storm damage is advised.

## 9. TECHNICAL SERVICES

Technical assistance, including more detailed information, product literature, test results, project lists, assistance in preparing project specifications and arrangements for application supervision, is available by contacting Metal Sales.

## 10. FILING SYSTEMS

Additional product information is available from the manufacturer upon request.

**Product** **Page No.**

## Panel Information



## Flashing Profiles



## Accessory Profiles



## Testing Information



## Design/Installation Considerations



## Detail Conditions



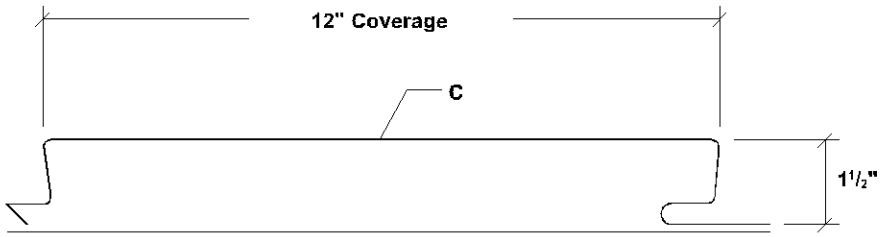
## Notes

# TL-17 AND TL-17A PANEL OVERVIEW

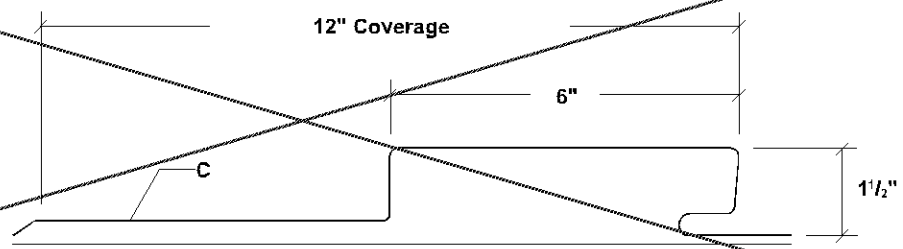
CASE #PL2019-40

## TL-17 PANEL PROFILE

SIDING 5A-a




## TL-17A PANEL PROFILE




## SUBSTRATE

Flush Faced panel is designed to be utilized over open structural framing, but can easily be used with a solid substrate. The recommended substrate is ⅝" plywood with a 30 pound felt moisture barrier. To avoid panel distortion, use a properly aligned and uniform substructure.

## COVERAGE

Flush Faced panels are available in a 12" width with 1½" heights.

## LENGTH

Lengths under 5'-0" are available with some cutting restrictions. Please consult your Metal Sales branch for maximum panel lengths and recommendations (see PGI-2 and PGI-3 for locations).

## AVAILABILITY

Panels are available in 24 through 16 gauge. Minimum quantities may apply.
Custom capabilities include:
-Perforated panels for wind screens and liner panels.
-Depth of panel.

## APPLICATION

Soffit, Fascia, Wall, Liner.

## FASTENING SYSTEM

Direct Fastened (concealed).

## FASTENERS

The fastener selection guide should be consulted for choosing proper fasteners for specific applications. Quantity and type of fastener must meet necessary loading and code requirements (see PGI-12-14).

## MATERIALS

Steel grade 50, per ASTM A-792. Optional material: stainless steel, weathering steel, copper, and aluminum.

## FINISH

- *Acrylic Coated Galvalume® (ACG) / ASTM A-792 - AZ55
- Prepainted Galvalume / ASTM A-792 - AZ50
- MS Colorfast45®
- **Fluorocarbon (PVDF)
- Multi-Pass Kynar
- Marbilique
- Plastisol
- Polyester

* Differential appearance of Acrylic Coated Galvalume roofing materials is not a cause for rejection.
** Meets both Kynar 500 and Hylar 5000 specifications.

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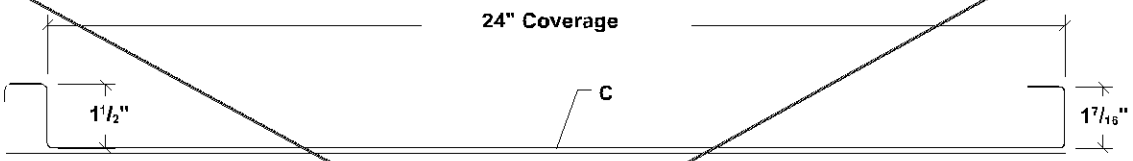
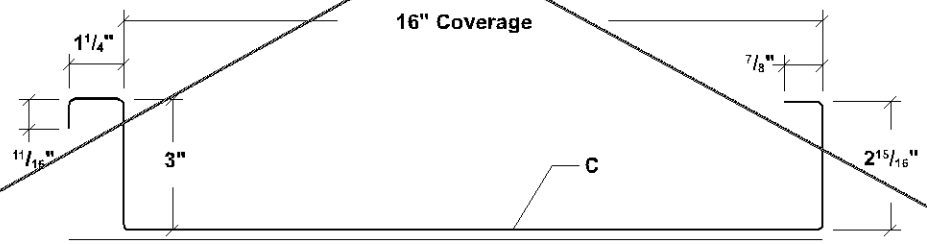
# FLUSH FACE / INTERIOR LINER SERIES TL-19A AND TL-21 PANEL OVERVIEW

## TL-19A PANEL PROFILE




## TL-21 PANEL PROFILE




## SUBSTRATE

Liner panel is designed to be utilized over open structural framing, but can easily be used with a solid substrate. The recommended substrate is 5/8" plywood with a 30 pound felt moisture barrier. To avoid panel distortion, use a properly aligned and uniform substructure.

## COVERAGE

Liner panels are available in a 16" (TL19A) or 24" (TL21) widths with 1 7/16" (TL19A) or 2 15/16" (TL21) heights.

## LENGTH

Lengths under 5'-0" are available with some cutting restrictions. Please consult your Metal Sales branch for maximum panel lengths and recommendations (see PGI-2 and PGI-3 for locations).

## AVAILABILITY

Panels are available in 24 through 16 gauge. Minimum quantities may apply.
Custom capabilities include:
-Perforated panels for wind screens and liner panels.
-Depth of panel.

## APPLICATION

Liner

## FASTENING SYSTEM

Direct Fastened (exposed).

## FASTENERS

The fastener selection guide should be consulted for choosing proper fasteners for specific applications. Quantity and type of fastener must meet necessary loading and code requirements (see PGI-12-14).

## MATERIALS

Steel grade 50, per ASTM A-792. Optional material: stainless steel, weathering steel, copper, and aluminum.

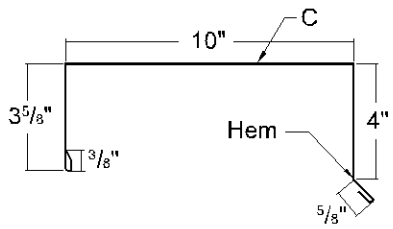
## FINISH

- *Acrylic Coated Galvalume® (ACG) / ASTM A-792 - AZ55
- Prepainted Galvalume / ASTM A-792 - AZ50
- MS Colorfast45®
- **Fluorocarbon (PVDF)
- Multi-Pass Kynar
- Marbilique
- Plastisol
- Polyester

* Differential appearance of Acrylic Coated Galvalume roofing materials is not a cause for rejection.
** Meets both Kynar 500 and Hylar 5000 specifications.

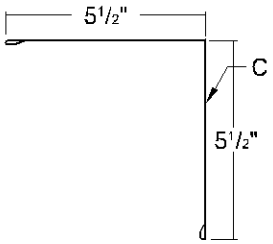
CASE #PL2019-40

## COPING



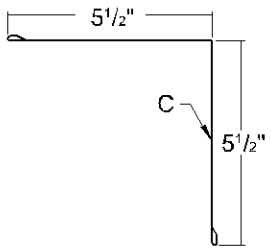

*Length 10'-0"*

## OUTSIDE CORNER



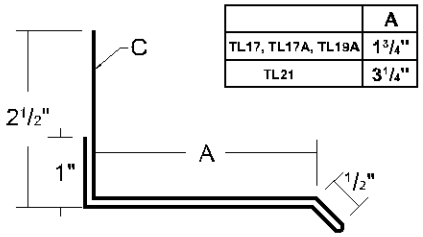

*Length 10'-0"*

## INSIDE CORNER




*Length 10'-0"*

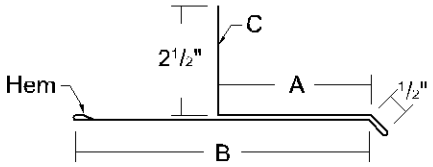
## CUSTOM SILL/HEAD




| | A |
|---|---|
| TL17, TL17A, TL19A | 1 3/4" |
| TL21 | 3 1/4" |

*Length 10'-0"*

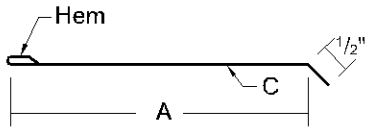
## CUSTOM SILL TO SOFFIT




| | A | B |
|---|---|---|
| TL17, TL17A, TL19A | 1 3/4" | 4" |
| TL21 | 3 1/4" | 5 1/2" |

*Length 10'-0"*

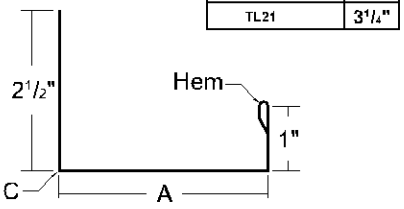
## CUSTOM SOFFIT CLEAT




| | A |
|---|---|
| TL17, TL17A, TL19A | 5" |
| TL21 | 5 3/4" |

*Length 10'-0" - *Specify Slope Angle*

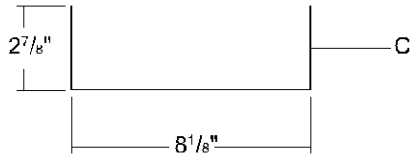
## CUSTOM JAMB




| | A |
|---|---|
| TL17, TL17A, TL19A | 1 3/4" |
| TL21 | 3 1/4" |

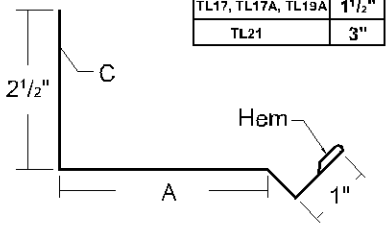
*Length 10'-0"*

## HEAD/JAMB COVER




*Length 10'-0"*

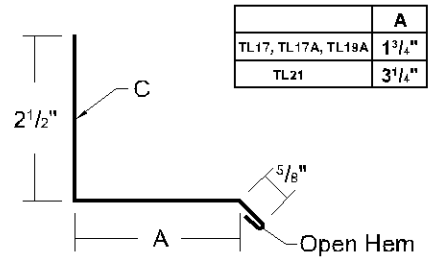
## CUSTOM HEAD CHANNEL




| | A |
|---|---|
| TL17, TL17A, TL19A | 1 1/2" |
| TL21 | 3" |

*Length 10'-0"*

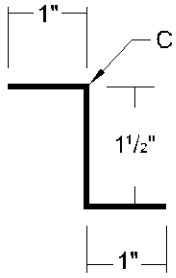
## CUSTOM BASE




| | A |
|---|---|
| TL17, TL17A, TL19A | 1 3/4" |
| TL21 | 3 1/4" |

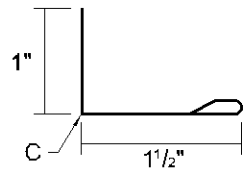
*Length 10'-0"*

## CUSTOM Z-CLOSURE




*Length 10'-0"*

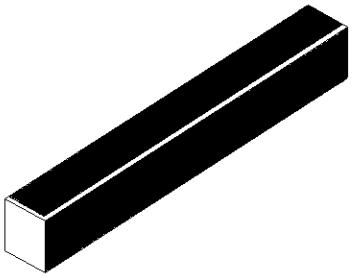
## SOFFIT PANEL MITER TRIM




*Length 10'-0"*

CASE #PL2019-40

## UNIVERSAL CLOSURE

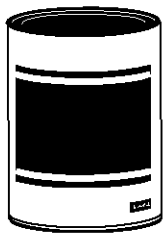


1" x 1½" x 50' Polyethylene Foam
1" x 1½" x 10' Polyethylene Foam

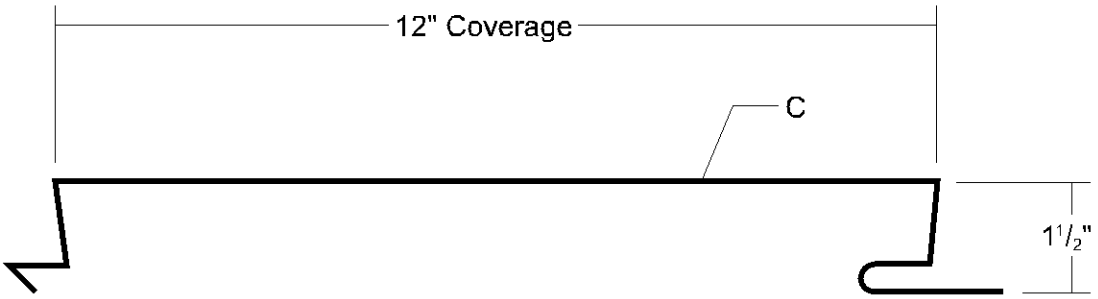
## TAPE SEALANT

⅜" X 3/32" X 50'
Single Bead
Butyl - Gray

## TOUCH-UP PAINT



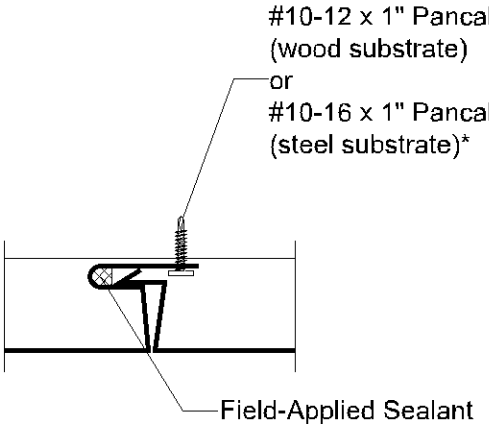
Available in pints
PVDF / MS Colorfast45



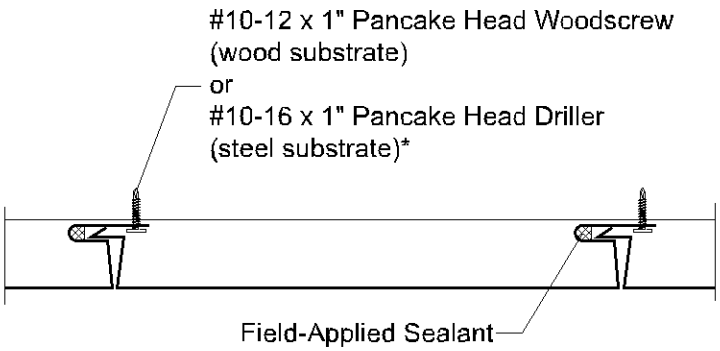

| SECTION PROPERTIES | | | | | | | | ALLOWABLE UNIFORM LOADS PSF (3 or More Equal Spans) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ga. | Width (in.) | Yield KSI | Weight PSF | Top in Compression | | Bottom in Compression | | Inward Load | | | | | | Outward Load | | | | | |
| | | | | Ixx $In^4/ft$ | Sxx $In^3/ft$ | Ixx $In^4/ft$ | Sxx $In^3/ft$ | 2' | 3' | 4' | 5' | 6' | 8' | 2' | 3' | 4' | 5' | 6' | 8' |
| 24 | 12" | 50 | 1.34 | 0.0495 | 0.0562 | 0.0746 | 0.0597 | 302 | 145 | 84 | 54 | 38 | 22 | 288 | 137 | 79 | 51 | 36 | 20 |
| 22 | 12" | 50 | 1.77 | 0.0724 | 0.0860 | 0.1025 | 0.0821 | 409 | 197 | 115 | 75 | 52 | 30 | 29 | 29 | 29 | 29 | 0 | 0 |
| 20 | 12" | 33 | 2.10 | 0.0986 | 0.1268 | 0.1294 | 0.1043 | 335 | 163 | 95 | 62 | 44 | 25 | 29 | 29 | 29 | 29 | 0 | 0 |
| 18 | 12" | 33 | 2.76 | 0.1480 | 0.1805 | 0.1790 | 0.1446 | 453 | 224 | 131 | 86 | 60 | 134 | 29 | 29 | 29 | 29 | 0 | 0 |

1. Theoretical section properties have been calculated per AISI 2001 "Specification for the Design of Cold-formed Steel Structural Members." Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable load is calculated in accordance with AISI 2001 specifications considering bending, shear, combined bending and shear, deflection, and panel testing. Allowable load considers the worst case of 3 and 4 equal span conditions. Allowable load does not address web crippling or fasteners/support connection or panel disengagement. Panel weight is not considered.
3. Deflection is limited to L/180.
4. Allowable loads do not include a 1/3 stress increase.

### ATTACHMENT DETAIL




### FASTENING PATTERNS




*Pre-drilling into thicker steel may be required.

## GENERAL INFORMATION

**▶ Substructure**
TL-17 panels are designed to be utilized over open structural framing or a solid substrate.

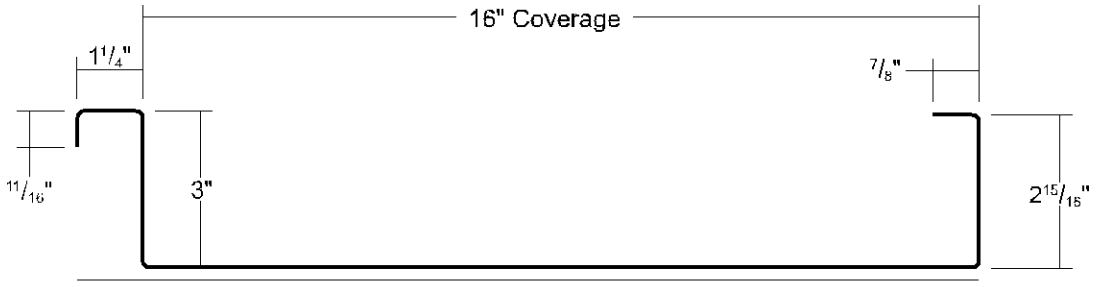
**▶ Coverage**
TL-17 panels are available in a 1½" depth with a 12" width coverage.

**▶ Length**
Minimum factory cut length is 5'-0".
Maximum available panel length is 22'-0".

**▶ Fasteners**
The fastener selection guide should be consulted for choosing the proper fastener for specific applications. Quantity and type of fastener must meet necessary loading and code requirements.
*NOTE: All panels are subject to surface distortion due to improperly applied fasteners. Overdriven fasteners will cause stress and induce oil canning across the face of the panel at or near the point of attachment.*

**▶ Availability**
*Finishes:* Kynar 500 (PVDF) standard; optional: multi-pass Kynar 500, Marblique, Plastisol, and Polyester
*Gauges:* 24ga, 22ga, 20ga, and 18ga

# FLUSH FACE / INTERIOR LINER SERIES ~~TL-21~~ SECTION PROPERTIES AND LOAD TABLES

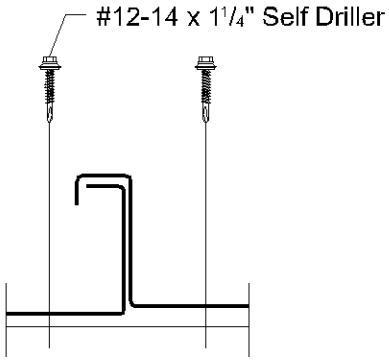



**NOTE: Either side of panel can be painted, please specify**

| SECTION PROPERTIES | | | | | | | | ALLOWABLE UNIFORM LIVE LOADS PSF (3 or More Equal Spans) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ga. | Width (in.) | Yield KSI | Weight PSF | Top in Compression | | Bottom in Compression | | Inward (Gravity / Deflection) Load | | | | | | Outward Uplift (Stress) Load | | | | | |
| | | | | Ixx $In^4/ft$ | Sxx $In^3/ft$ | Ixx $In^4/ft$ | Sxx $In^3/ft$ | 4' | 5' | 6' | 7' | 8' | 9' | 4' | 5' | 6' | 7' | 8' | 9' |
| **24** | 16" | 50 | 1.38 | 0.3158 | 0.1244 | 0.1883 | 0.1100 | 130 | 89 | 64 | 49 | 38 | 30 | 141 | 97 | 71 | 54 | 42 | 34 |
| **22** | 16" | 50 | 1.82 | 0.4838 | 0.1972 | 0.2708 | 0.1667 | 219 | 145 | 103 | 77 | 59 | 47 | 250 | 168 | 120 | 89 | 69 | 55 |
| **20** | 16" | 33 | 2.22 | 0.7050 | 0.3005 | 0.3720 | 0.2447 | 223 | 145 | 102 | 76 | 58 | 46 | 266 | 175 | 124 | 92 | 71 | 59 |
| **18** | 16" | 33 | 2.93 | 0.9488 | 0.4070 | 0.5438 | 0.3431 | 312 | 204 | 143 | 106 | 81 | 65 | 363 | 238 | 168 | 125 | 96 | 76 |

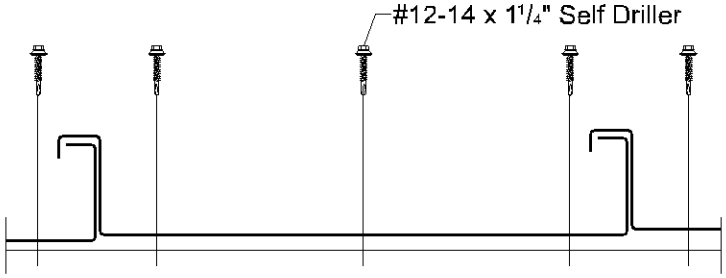
1. Section properties and allowable loads are calculated per AISI 2001, including 2004 Supplement.
2. Ixx and Sxx are effective section properties for deflection and bending.
3. Allowable loads/spans are calculated considering bending, shear, combined bending and shear and deflection.
4. Allowable load/span calculations do not include consideration for web crippling, fastener / connection limitations or uplift testing.
5. Allowable loads/spans do not include a 1/3 stress increase.

## ATTACHMENT DETAIL




## FASTENING PATTERN

**Ends and Field of Panel**




## GENERAL INFORMATION

**▶ Substructure**
TL-21 Panels are designed to be utilized over open structural framing or a solid substrate.

**▶ Coverage**
TL-21 Panels are available in a 3" depth with a 16" width coverage.

**▶ Length**
Minimum factory cut length is 5'-0".
Maximum available panel length is 32'-0".

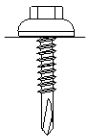
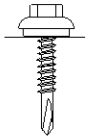
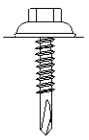
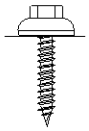
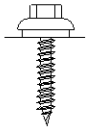
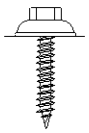
**▶ Fasteners**
The fastener selection guide should be consulted for choosing the proper fastener for specific applications. Quantity and type of fastener must meet necessary loading and code requirements.
*NOTE: All panels are subject to surface distortion due to improperly applied fasteners. Overdriven fasteners will cause stress and induce oil canning across the face of the panel at or near the point of attachment.*

**▶ Availability**
*Finishes:* Kynar 500 (PVDF) standard; optional: multi-pass Kynar, Marblique, Plastisol, Polyester, and MS Colorfast45® (SMP)
*Gauges:* 24ga, 22ga, 20ga, and 18ga

## FASTENER INSTALLATION TECHNIQUE

**Recommended Tool Type -** Use depth locating nose or adjustable clutch on screw gun to prevent overdrilling and strip out. **Do not use impact tools or runners.**

**Seating the washer -** Apply sufficient torque to seat the washer - do not overdrive the fastener.

| | CORRECT<br>Sealing material slightly visible at edge of metal washer. Assembly is watertight. | TOO LOOSE<br>Sealing material is not visible; not enough compression to seal properly. | TOO TIGHT<br>Metal washer deformed; sealing material pressed beyond washer edge. |
|---|---|---|---|
| SELF DRILLER |  |  |  |
| WOODSCREW |  |  |  |

**To prevent wobbling -** Make sure fastener head is completely engaged in the socket. If the head does not go all the way in the socket - tap the magnet deeper into the socket to allow full head engagement. Metal chips will build up from drilling and should be removed from time to time.

**Protect drill point** - Push only hard enough on the screw gun to engage clutch. This prevents excess friction and burn out of the drill point. Correct pressure will allow screw to drill and tap without binding.

**Drilling through sheet and insulation -** Ease up on pressure when drilling through insulation to avoid striking the purlin or girt with the point - apply more pressure after drill point contacts purlin or girt.

**Drilling through purlin overlaps -** Drilling through lapped purlins requires extra care. Excessive voids between purlins sometimes damages drill points and two self-drillers might be necessary to complete the operation. It is sometimes advantageous to predrill.

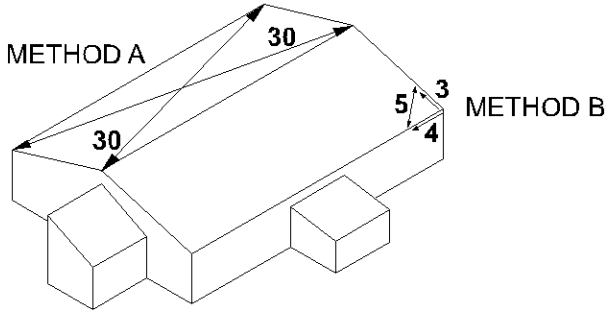
## CONDITION OF SUBSTRUCTURE

Whether over solid substrate or open structural framing, panel distortion may occur if not applied over properly aligned and uniform substructure.

The installer should check the roof deck for squareness before installing Flush Face / Interior Liner panels. Several methods can be used to verify squareness of the structure for proper installation of the panels.

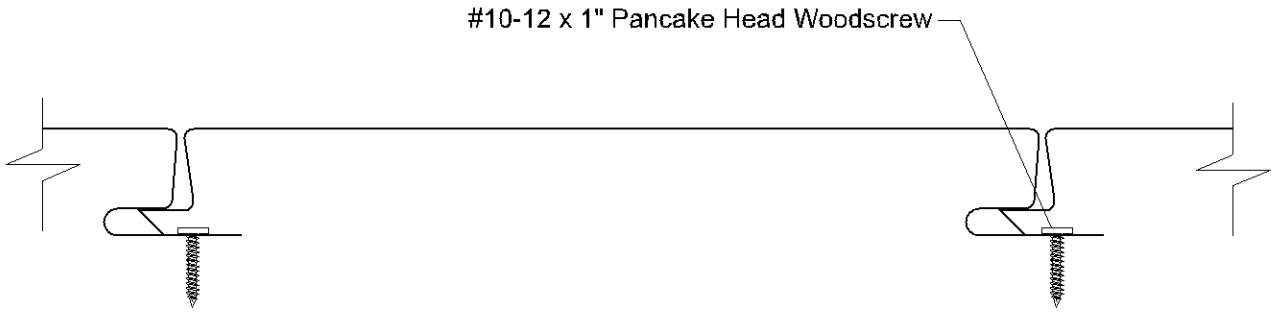
**METHOD "A" -** One method for checking the roof for squareness is to measure diagonally across one slope of the roof from similar points at the ridge and eave and obtain the same dimension.

**METHOD "B" -** The 3-4-5 triangle system may also be used. To use this system measure a point from the corner along the edge of the roof at a module of three (3). Measure a point from the same corner along another edge at a module of four (4). Then by measuring diagonally between the two points established, the dimension should be exactly a module of five (5) to have a square corner. Multiple uses of this system may be required to determine building squareness. If the endwall cannot be made square, the roof system cannot be installed as shown in these instructions.

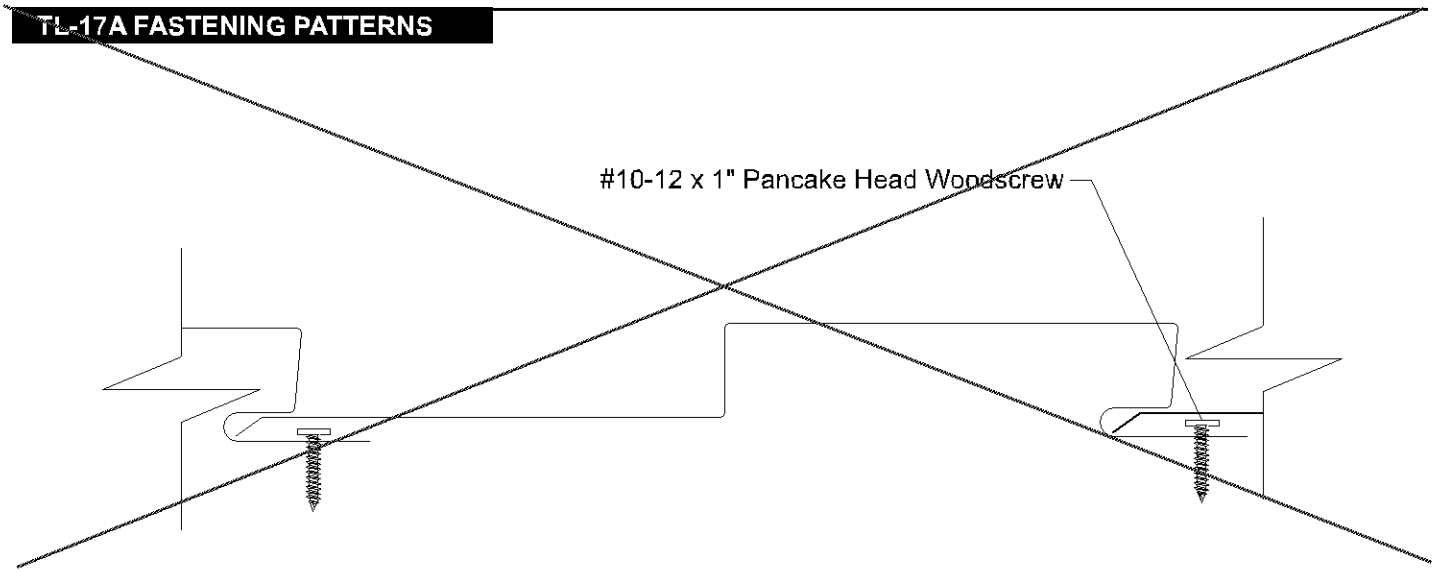


## TL-17 FASTENING PATTERNS

SIDING 5A-a

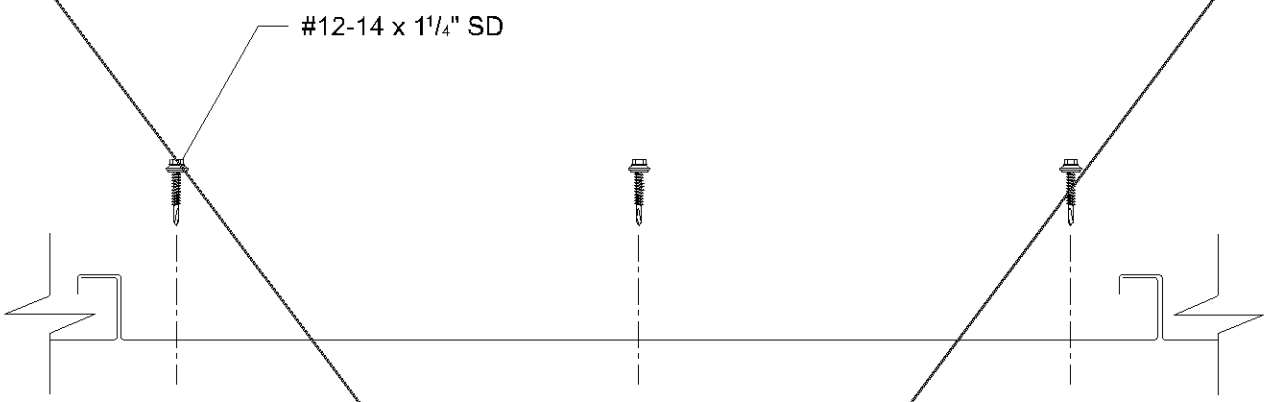



## TL-17A FASTENING PATTERNS

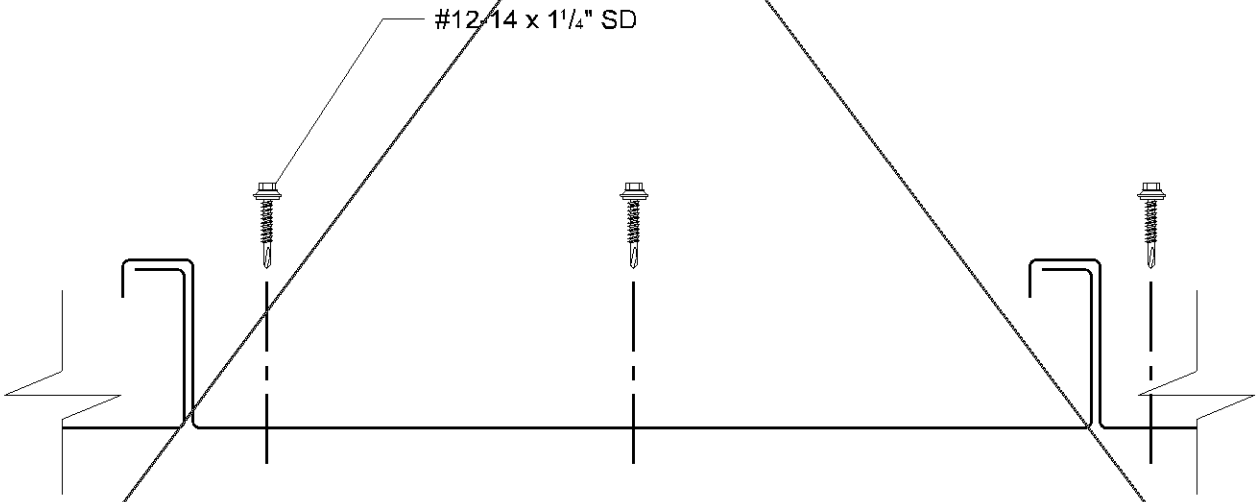


# FLUSH FACE / INTERIOR LINER SERIES DESIGN / INSTALLATION CONSIDERATIONS (CONT.)

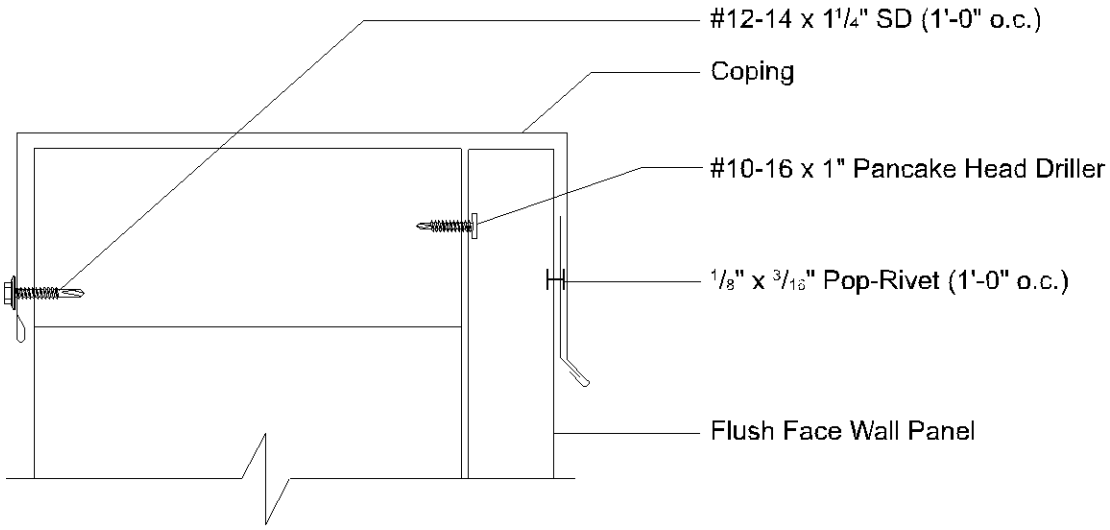
## TL-19A FASTENING PATTERNS



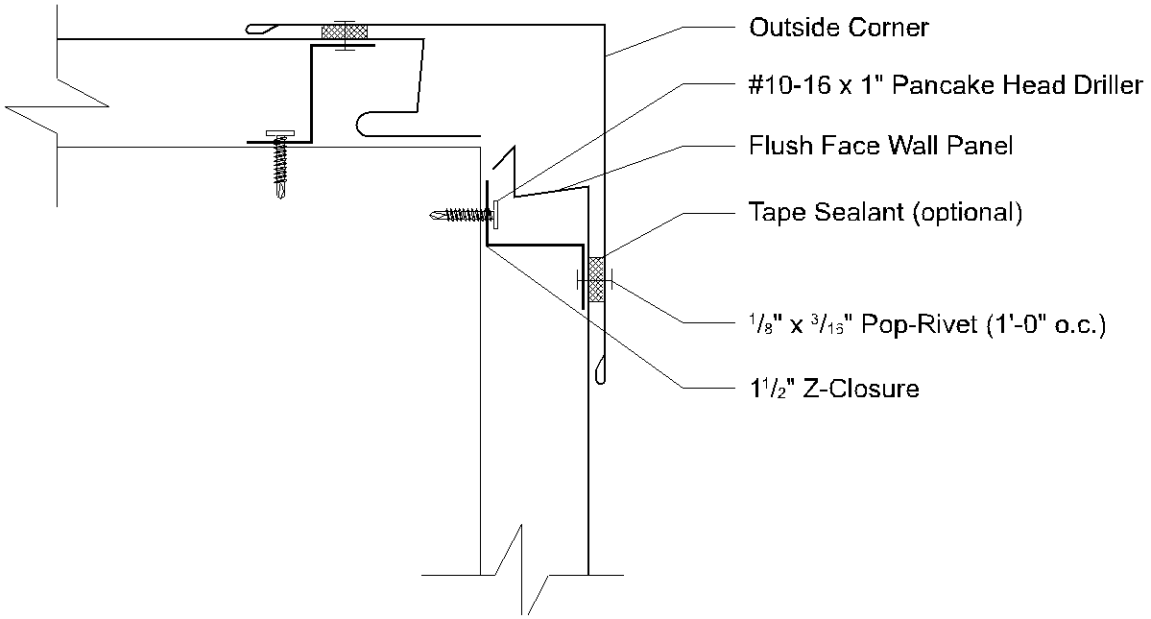

## TL-21 FASTENING PATTERNS



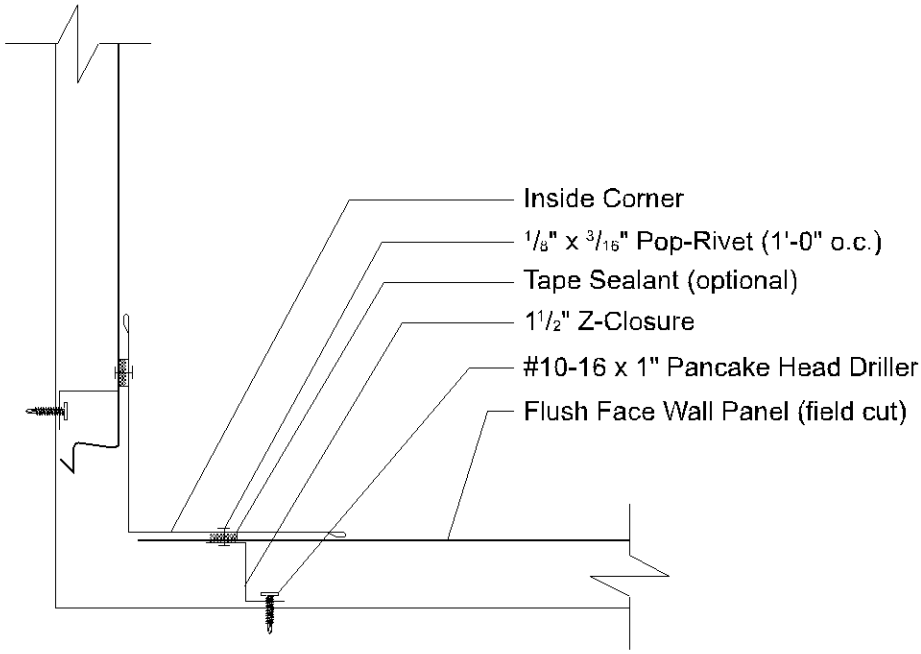
## Flush Face / Interior Liner Series — Coping Detail



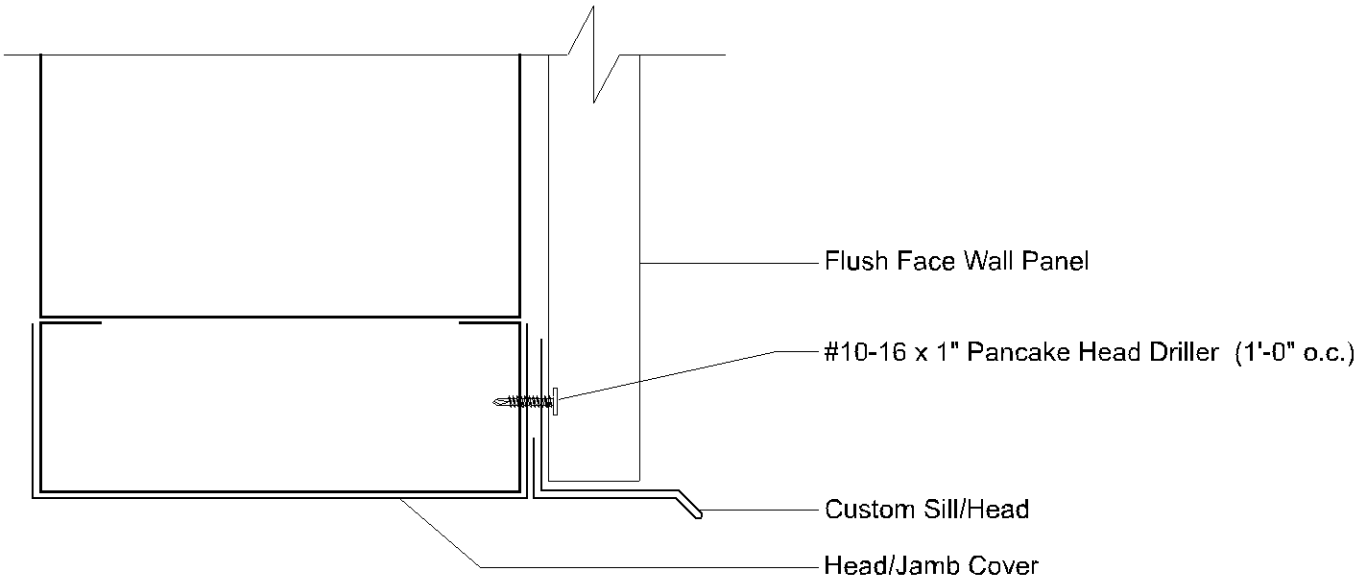

## Flush Face / Interior Liner Series — Outside Corner Detail



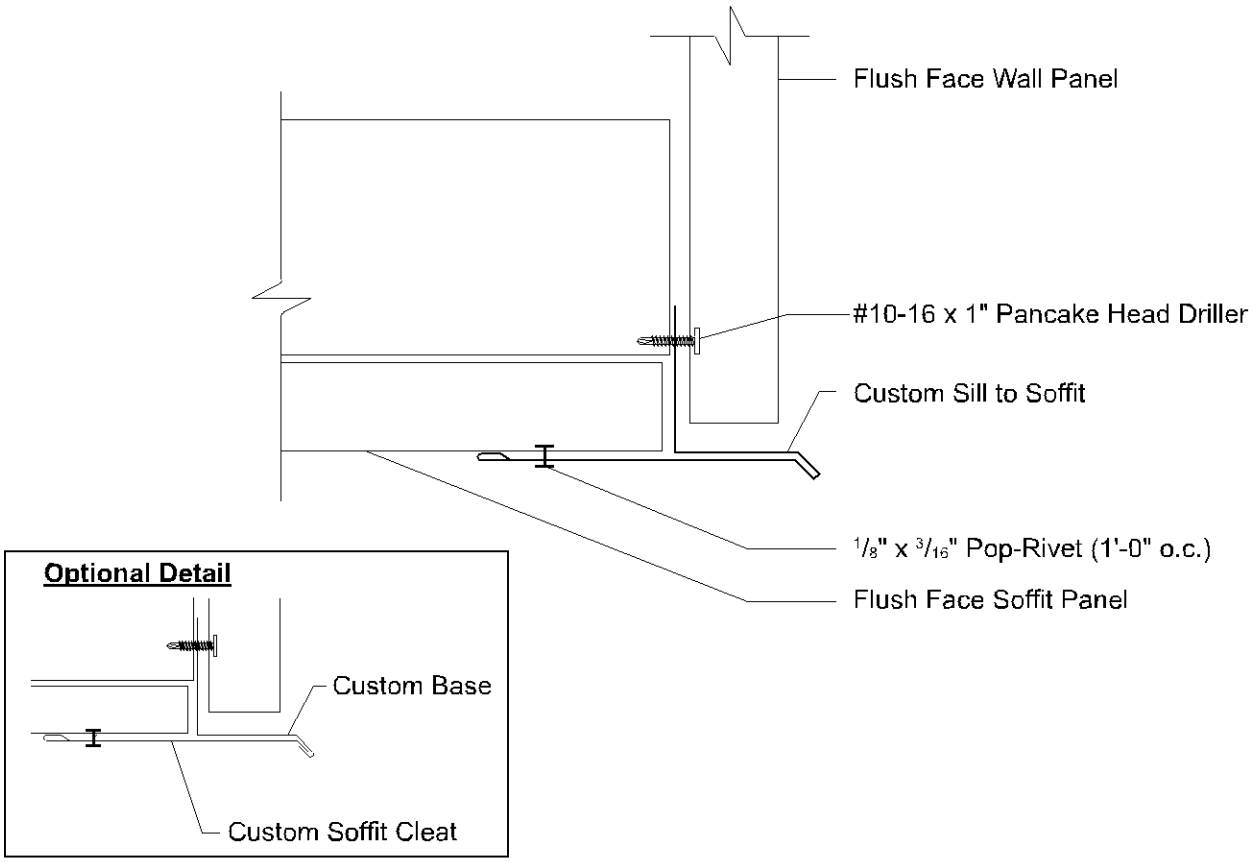
## FLUSH FACE / INTERIOR LINER SERIES — INSIDE CORNER DETAIL



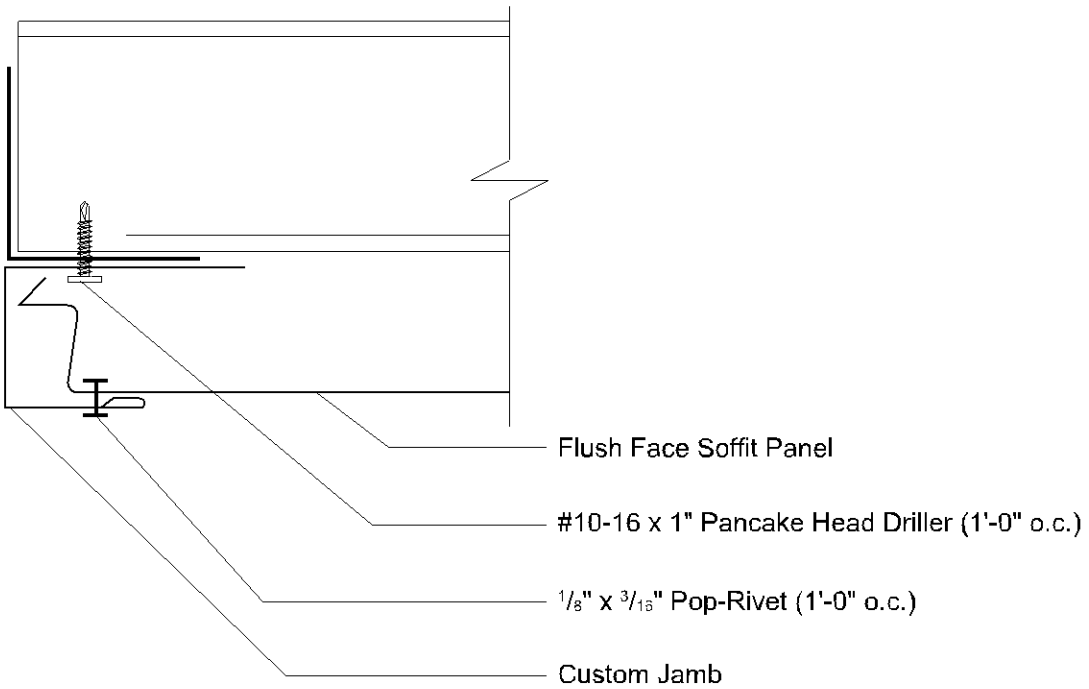

## FLUSH FACE / INTERIOR LINER SERIES — SILL/HEAD DETAIL



## FLUSH FACE / INTERIOR LINER SERIES — SILL TO SOFFIT DETAIL




## FLUSH FACE / INTERIOR LINER SERIES — SOFFIT JAMB DETAIL



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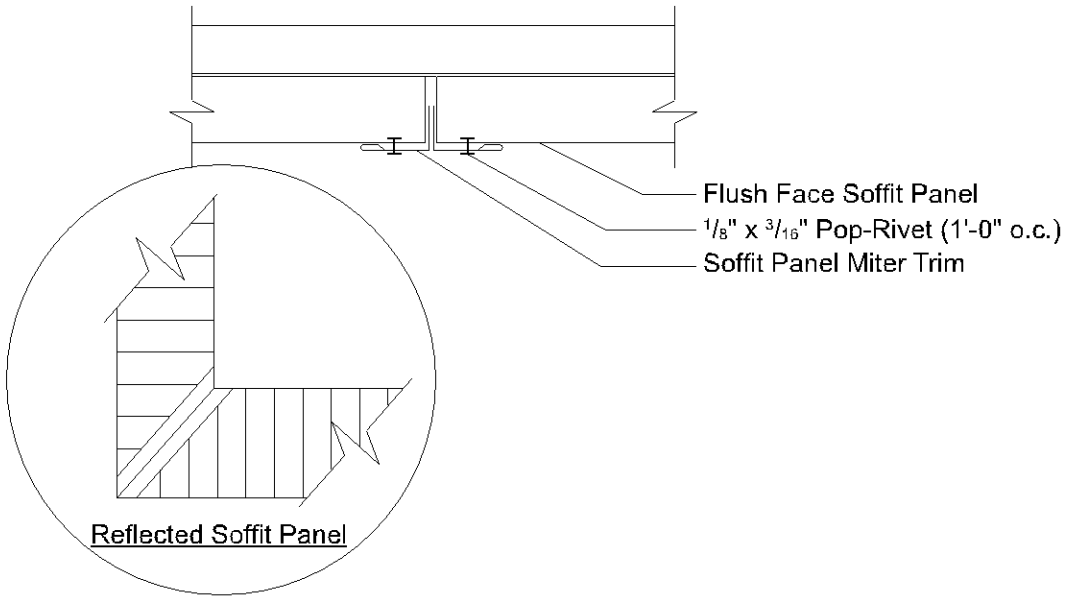
## FLUSH FACE / INTERIOR LINER SERIES SOFFIT MITER TRIM DETAIL

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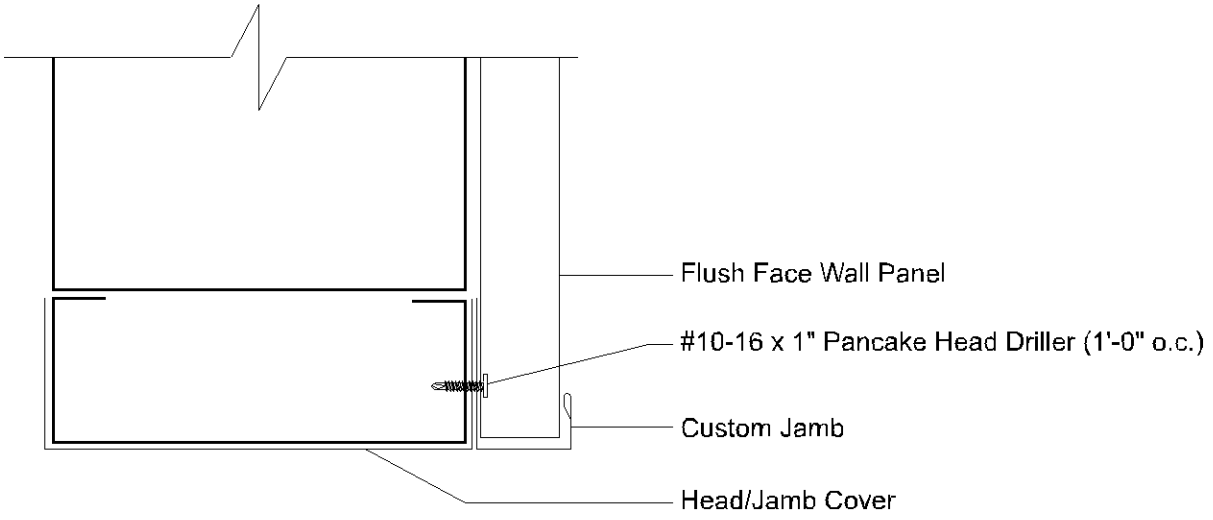
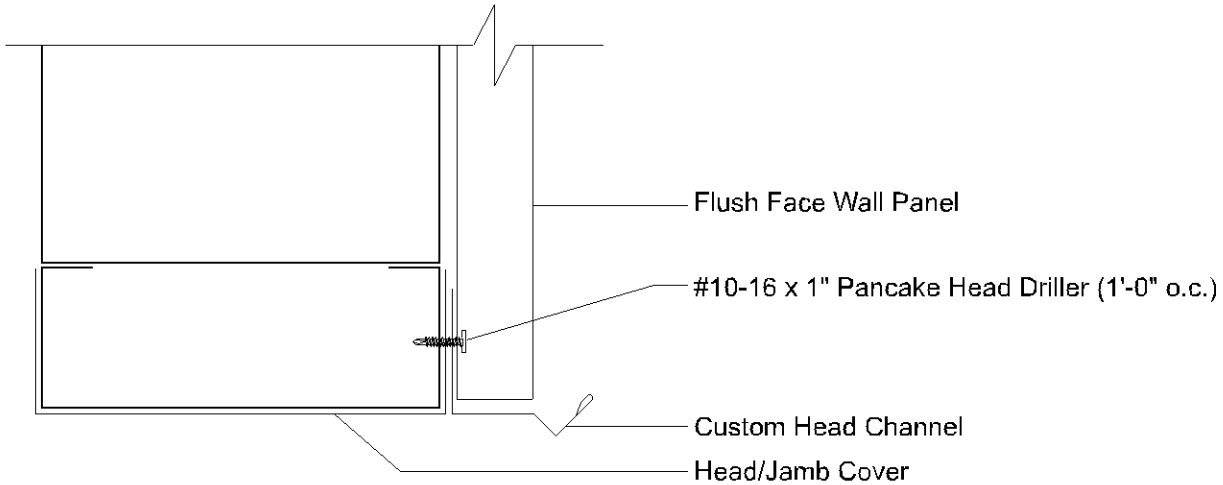
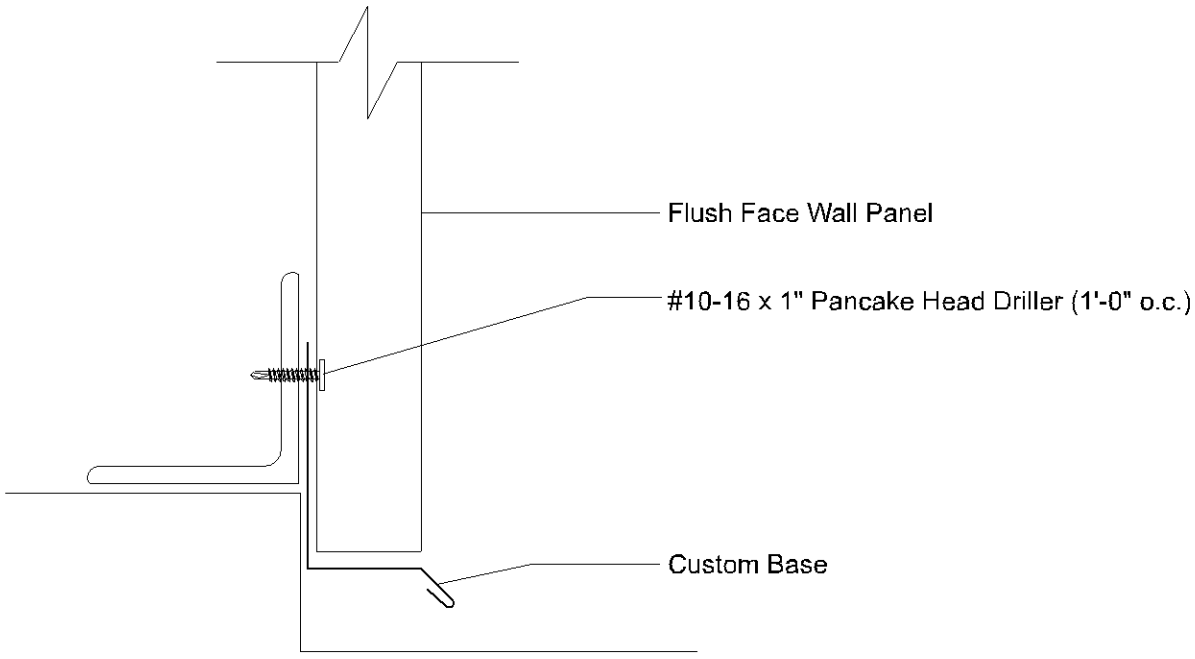


## FLUSH FACE / INTERIOR LINER SERIES HEAD DETAIL




## FLUSH FACE / INTERIOR LINER SERIES BASE DETAIL



CASE #PL2019-40

## Important Information

The application and detail drawings in this manual are strictly for illustration purposes and may not be applicable to all building designs or product installations. All projects should conform to applicable building codes for that particular area. It is recommended to follow all building regulations and standard industry practices.

Metal Sales Manufacturing Corporation is not responsible for the performance of the wall system if it is not installed in accordance with the suggested instructions referenced in this manual. If there is a conflict between this manual and the actual erection drawings, the erection drawings are to take precedence.

Prior to ordering and installing materials, all dimensions should be verified by field measurements.

Metal Sales reserves the right to modify, without notice, any details, recommendations or suggestions. Any questions you may have regarding proper installation of these Concealed Fastened Wall Panel systems should be directed to your local Metal Sales representative (see pages 2 and 3).

Oil canning is not a cause for rejection. Oil canning can be described as the amount of waviness found in the flat areas of metal panels. Oil canning is an inherent characteristic of light gauge cold formed metal products, particularly those with broad flat areas. There are many factors which may contribute to oil canning that Metal Sales is not able to control. These factors include: misalignment of the support system, over driving of fasteners used on the panels, stress (whether inherent in the panel or induced), thermal expansion and contraction of the panel, improper material handling, width, gauge, length, color of panels and improper installation (reference Metal Construction Association "Oil Canning Position Paper"- Appendix A).

Consult your local Metal Sales Branch for any additional information not outlined in this manual.

This manual is designed to be utilized as a guide when installing a Concealed Fastened Wall Panel system. It is the responsibility of the erector to ensure the safe installation of this product system.

# SAFETY

STUDY APPLICABLE OSHA AND OTHER SAFETY REQUIREMENTS BEFORE FOLLOWING THESE INSTRUCTIONS.

The installation of metal wall systems is a dangerous procedure and should be supervised by trained knowledgeable erectors. USE EXTREME CARE WHILE INSTALLING WALL PANELS. It is not possible for Metal Sales to be aware of all the possible job site situations that could cause an unsafe condition to exist. The erector of the wall system is responsible for reading these instructions and determining the safest way to install the wall system.

These instructions are provided only as a guide to show a knowledgeable, trained erector the correct relationship of parts to one another. If following any of the installation steps would endanger a worker, the erector should stop work and decide upon a corrective action.

Fall protection for workers installing wall panels must be provided.

**Safety**
Use proper safety gear, safe equipment and safe processes. Safety gear includes gloves, arm guards, safety goggles and fall protection. Safe equipment includes maintained screw gun, saw, snips and folder. Safe processes include being aware of dangers and taking appropriate measures to avoid them.

**Material Availability**
Panels are available in 24 ga, 22 ga and 20 ga steel and 0.032" aluminum. Flashings are available in 24 ga and 22 ga steel and 0.032" aluminum. Only 24 ga panel and flashing materials, in standard colors, are stocked. Custom 24 ga colors, all 22 ga, all 20 ga and all 0.032" materials are secured per project and require minimum order quantities.

**Material Receipt**
Upon receipt of material, confirm all parts have been delivered and that there is no damage. Any shortages should be reported to the Metal Sales contact. Transit damage should be noted on the bill of lading.

**Material Storage**
Material not used right away, should be stored inside, out of the elements. If inside storage is not available, tarp the material such that air can circulate. Elevate the crates off the ground and slope so that water will run off.

**Handling**
Transport panels in the crates to the installation site. Adequate support for individual panels every 6' to 8' is necessary. Grasp a panel by one side and let the other side hang down.

**Wall Condition**
Before installing panels, ensure the wall support material is plumb, square and true. Variance from in-plane should not exceed 1/4" in 10'.

**Wall Assembly**
Cover building envelope sheathing with a moisture barrier, such as peel-and-stick underlayment or synthetic building wrap for resistance to air and water penetration through the wall assembly. Install the moisture barrier horizontally from the bottom upward, overlapping each run over the previous, lower run.

**Spacers**
Spacers with a minimum depth of 1/4" are recommended at clips and trims to hold the wall assembly off of the wall line and allow water to drain. Spacers may be shims, hat channels or furring strips installed to not hold water.

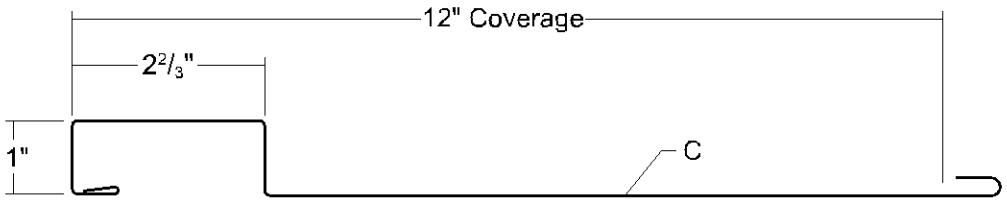
**Plan the Work**
Before installing panels on a wall section, plan for alignment with adjacent wall sections. Decide if the first panel will be a full or partial panel. Consider the locations of wall penetrations and openings.

**Clip Fasteners**
Do not overtighten the panel clip fasteners. The fasteners should be brought just to firm contact between the support material, panel and clip. Overtightening the clip fasteners can make installation of the next panel difficult. The panel must be capable of sliding along its length after the clips are installed. The number of fasteners per clip can be either one or two, depending on the support material and the design load requirements.

**Installation Practice**
For horizontal panels, start at the bottom of the wall and work up the wall toward the top. Always 'shingle' panels and trims so that water will run down off of one member on to the next. Ensure every surface has adequate slope to permit water to run off and not collect on any surface. When installing panels, give effort to stay on module by checking the coverage of each panel.

**Strippable Film**
Panels and trim are typically provided with strippable film as protection against minor fabrication, transit and handling damage. The strippable film must be removed just before installation. Waiting until after panel installation to remove the strippable film or after significant exposure to sunlight or heat can make removal very difficult.

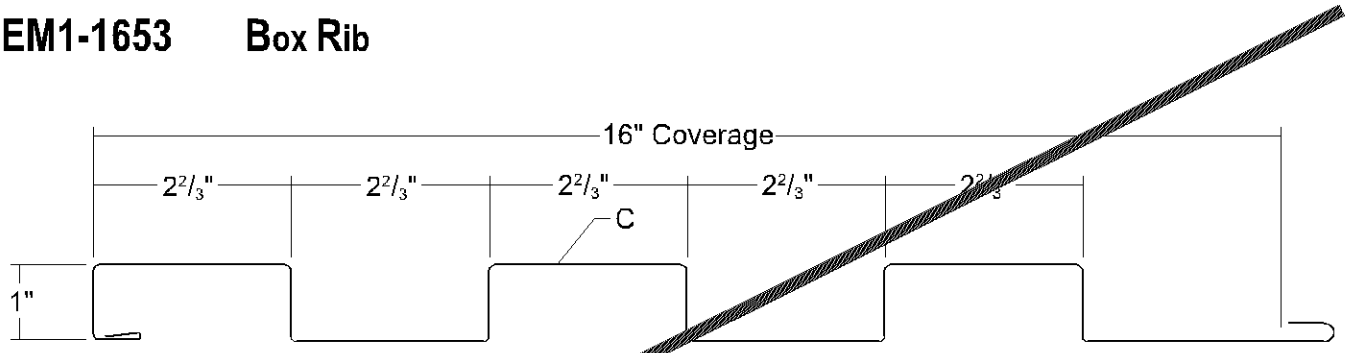
## EM1-1212 Box Rib




Panel can be produced in lengths from 5' to 30'.

| Product No. | Coverage | Description | Thick | Finish |
|---|---|---|---|---|
| 2774541 | 12" | 1 rib | 24 ga | Galvalume® (ACG) |
| 27745XX | 12" | 1 rib | 24 ga | PVDF Painted |
| 2974541 | 12" | 1 rib | 22 ga | Galvalume® (ACG) |
| 29745XX | 12" | 1 rib | 22 ga | PVDF Painted |
| 30745XX | 12" | 1 rib | 20 ga | PVDF Painted |
| 27745XXA | 12" | 1 rib | 0.032" | PVDF Painted Aluminum |

## EM1-1653 Box Rib

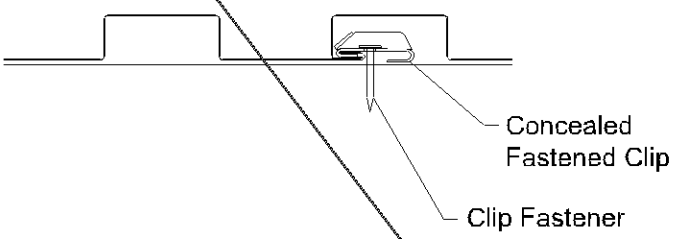



Panel can be produced in lengths from 5' to 30'.

| Product No. | Coverage | Description | Thick | Finish |
|---|---|---|---|---|
| 2775041 | 16" | 3 ribs | 24 ga | Galvalume® (ACG) |
| 27750XX | 16" | 3 ribs | 24 ga | PVDF Painted |
| 2975041 | 16" | 3 ribs | 22 ga | Galvalume® (ACG) |
| 29750XX | 16" | 3 ribs | 22 ga | PVDF Painted |
| 30750XX | 16" | 3 ribs | 20 ga | PVDF Painted |
| 27750XXA | 16" | 3 ribs | 0.032" | PVDF Painted Aluminum |

# EM1-1653 Box Rib

## PANEL ATTACHMENT




## FASTENING INFORMATION

- Concealed Fastened Clip is $2^1/_4$" x $1^3/_4$" x $^3/_4$", from 16 ga, G90 material with 2 fastener holes.
- Clip Fastener(s) should be driven just to contact between fastener head / clip / panel / support. Beyond contact, the clip can crush the open hem of the panel and make engagement of the next panel difficult. Overdriven fasteners will cause panel distortions.
- Fasteners should extend $^1/_2$" or more past the inside face of the support material for steel and wood sheathing support materials.
- Clip Fasteners:
  - Attaching to Wood:
    - #12-11 x $1^1/_2$" Low Profile Wood Screw
  - Attaching to Steel:
    - < 18 ga: $^1/_4$"-13 Deck Screw
    - ≥ 18 ga, ≤ 12 ga: #10-16 Pancake Head Driller
    - > 12 ga: $^1/_4$"-14 Self Driller, No Washer

## INSTALLATION DIRECTION

Horizontally-oriented panels must be installed from the bottom to the top.

Vertically-oriented panels may be installed from the right-to-left or left-to-right.

## STEEL SECTION PROPERTIES

## ALLOWABLE UNIFORM LOADS, psf For various clip spacings

| Ga | Width in | Yield ksi | Weight psf | Top In Compression | | Bottom In Compression | | Inward Load | | | | | Outward Load | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Ixx in⁴/ft | Sxx in³/ft | Ixx in⁴/ft | Sxx in³/ft | 2' | 3' | 4' | 5' | 6' | 2' | 3' | 4' | 5' | 6' |
| **24** | 16 | 50 | 1.39 | 0.0495 | 0.0729 | 0.0533 | 0.0911 | 120 | 97 | 71 | 47 | 23 | 70 | 58 | 45 | 33 | 21 |
| **22** | 16 | 50 | 1.81 | 0.0713 | 0.1094 | 0.0750 | 0.1340 | 120 | 97 | 71 | 47 | 23 | 70 | 58 | 45 | 33 | 21 |
| **20** | 16 | 33 | 2.21 | 0.1005 | 0.1658 | 0.1020 | 0.1967 | 120 | 97 | 71 | 47 | 23 | 70 | 58 | 45 | 33 | 21 |

1. Theoretical section properties have been calculated per AISI 2012 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable loads are calculated in accordance with AISI 2012 specifications considering bending, shear, combined bending and shear, deflection, load testing on 16 ga girts and load testing of comparable profiles. Allowable loads consider the 3 or more equal spans condition. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase for wind.

## ALUMINUM SECTION PROPERTIES

## ALLOWABLE UNIFORM LOADS, psf For various clip spacings

| Thick in | Width in | Yield ksi | Weight psf | I in⁴/ft | $S_{Top}$ in³/ft | $S_{Bottom}$ in³/ft | Inward Load | | | | | | Outward Load | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2' | 2.5' | 3' | 4' | 5' | 6' | 2' | 2.5' | 3' | 4' | 5' | 6' |
| 0.032 | 16 | 17 | 0.67 | 0.1080 | 0.1977 | 0.2369 | 100 | 89 | 79 | 57 | 36 | 14 | 63 | 58 | 53 | 43 | 33 | 23 |

1. Section properties have been calculated per 2010 Aluminum Design Manual. I and S are section properties for deflection and bending.
2. Allowable load is calculated in accordance with 2010 Aluminum Design Manual specifications considering bending, shear, combined bending and shear, deflection, load testing on 16 ga girts and load testing of comparable profiles. Allowable load does not address web crippling or other fasteners or support materials. Allowable loads consider the 3 or more equal spans condition. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase in wind.

## EM1-1653 Box Rib

# EM1-1653 on 16 ga Girts

## *Wall Fastener Spacing (feet)*

### 100C

| Wind Speed (mph) Exposure Category | 20 ft, Mean Roof Height | | | 40 ft, Mean Roof Height | | | 60 ft, Mean Roof Height | | |
|---|---|---|---|---|---|---|---|---|---|
| | Thickness | Field -15.1 psf | Edge -18.6 psf | Thickness | Field -17.4 psf | Edge -21.5 psf | Thickness | Field -19 psf | Edge -23.4 psf |
| 100C | 24 ga | 6.00 | 6.00 | 24 ga | 6.00 | 5.50 | 24 ga | 6.00 | 5.50 |
| | 22 ga | 6.00 | 6.00 | 22 ga | 6.00 | 5.50 | 22 ga | 6.00 | 5.50 |
| | 20 ga | 6.00 | 6.00 | 20 ga | 6.00 | 5.50 | 20 ga | 6.00 | 5.50 |
| | 0.032" | 6.00 | 6.00 | 0.032" | 6.00 | 6.00 | 0.032" | 6.00 | 5.50 |

### 110C

| | Thickness | Field -18.2 psf | Edge -22.5 psf | Thickness | Field -21.1 psf | Edge -26 psf | Thickness | Field -23 psf | Edge -28.4 psf |
|---|---|---|---|---|---|---|---|---|---|
| 110C | 24 ga | 6.00 | 5.50 | 24 ga | 5.50 | 5.50 | 24 ga | 5.50 | 5.00 |
| | 22 ga | 6.00 | 5.50 | 22 ga | 5.50 | 5.50 | 22 ga | 5.50 | 5.00 |
| | 20 ga | 6.00 | 5.50 | 20 ga | 5.50 | 5.50 | 20 ga | 5.50 | 5.00 |
| | 0.032" | 6.00 | 5.50 | 0.032" | 6.00 | 5.50 | 0.032" | 5.50 | 5.00 |

### 120C

| | Thickness | Field -21.7 psf | Edge -26.8 psf | Thickness | Field -25.1 psf | Edge -31 psf | Thickness | Field -27.4 psf | Edge -33.8 psf |
|---|---|---|---|---|---|---|---|---|---|
| 120C | 24 ga | 5.50 | 5.50 | 24 ga | 5.50 | 5.00 | 24 ga | 5.00 | 4.50 |
| | 22 ga | 5.50 | 5.50 | 22 ga | 5.50 | 5.00 | 22 ga | 5.00 | 4.50 |
| | 20 ga | 5.50 | 5.50 | 20 ga | 5.50 | 5.00 | 20 ga | 5.00 | 4.50 |
| | 0.032" | 6.00 | 5.50 | 0.032" | 5.50 | 5.00 | 0.032" | 5.50 | 4.50 |

### 130C

| | Thickness | Field -25.5 psf | Edge -31.4 psf | Thickness | Field -29.5 psf | Edge -36.4 psf | Thickness | Field -32.1 psf | Edge -39.6 psf |
|---|---|---|---|---|---|---|---|---|---|
| 130C | 24 ga | 5.50 | 5.00 | 24 ga | 5.00 | 4.50 | 24 ga | 5.00 | 4.00 |
| | 22 ga | 5.50 | 5.00 | 22 ga | 5.00 | 4.50 | 22 ga | 5.00 | 4.00 |
| | 20 ga | 5.50 | 5.00 | 20 ga | 5.00 | 4.50 | 20 ga | 5.00 | 4.00 |
| | 0.032" | 5.50 | 5.00 | 0.032" | 5.00 | 4.50 | 0.032" | 5.00 | 4.00 |

### 140C

| | Thickness | Field -29.5 psf | Edge -36.5 psf | Thickness | Field -34.2 psf | Edge -42.2 psf | Thickness | Field -37.2 psf | Edge -46 psf |
|---|---|---|---|---|---|---|---|---|---|
| 140C | 24 ga | 5.00 | 4.50 | 24 ga | 4.50 | 4.00 | 24 ga | 4.50 | 3.50 |
| | 22 ga | 5.00 | 4.50 | 22 ga | 4.50 | 4.00 | 22 ga | 4.50 | 3.50 |
| | 20 ga | 5.00 | 4.50 | 20 ga | 4.50 | 4.00 | 20 ga | 4.50 | 3.50 |
| | 0.032" | 5.00 | 4.50 | 0.032" | 4.50 | 4.00 | 0.032" | 4.50 | 3.50 |

### 150C

| | Thickness | Field -33.9 psf | Edge -41.9 psf | Thickness | Field -39.2 psf | Edge -48.4 psf | Thickness | Field -42.7 psf | Edge -52.8 psf |
|---|---|---|---|---|---|---|---|---|---|
| 150C | 24 ga | 4.50 | 4.00 | 24 ga | 4.50 | 3.50 | 24 ga | 4.00 | 3.00 |
| | 22 ga | 4.50 | 4.00 | 22 ga | 4.50 | 3.50 | 22 ga | 4.00 | 3.00 |
| | 20 ga | 4.50 | 4.00 | 20 ga | 4.50 | 3.50 | 20 ga | 4.00 | 3.00 |
| | 0.032" | 4.50 | 4.00 | 0.032" | 4.00 | 3.00 | 0.032" | 4.00 | 3.00 |

### 160C

| | Thickness | Field -38.6 psf | Edge -47.6 psf | Thickness | Field -44.6 psf | Edge -55.1 psf | Thickness | Field -48.6 psf | Edge -60 psf |
|---|---|---|---|---|---|---|---|---|---|
| 160C | 24 ga | 4.50 | 3.50 | 24 ga | 4.00 | 3.00 | 24 ga | 3.50 | 2.50 |
| | 22 ga | 4.50 | 3.50 | 22 ga | 4.00 | 3.00 | 22 ga | 3.50 | 2.50 |
| | 20 ga | 4.50 | 3.50 | 20 ga | 4.00 | 3.00 | 20 ga | 3.50 | 2.50 |
| | 0.032" | 4.00 | 3.50 | 0.032" | 3.50 | 2.50 | 0.032" | 3.00 | 2.00 |

### 170C

| | Thickness | Field -43.6 psf | Edge -53.8 psf | Thickness | Field -50.4 psf | Edge -62.2 psf | Thickness | Field -54.9 psf | Edge -67.8 psf |
|---|---|---|---|---|---|---|---|---|---|
| 170C | 24 ga | 4.00 | 3.00 | 24 ga | 3.50 | 2.50 | 24 ga | 3.00 | 2.00 |
| | 22 ga | 4.00 | 3.00 | 22 ga | 3.50 | 2.50 | 22 ga | 3.00 | 2.00 |
| | 20 ga | 4.00 | 3.00 | 20 ga | 3.50 | 2.50 | 20 ga | 3.00 | 2.00 |
| | 0.032" | 3.50 | 2.50 | 0.032" | 3.00 | 2.00 | 0.032" | N.G. | N.G. |

**Notes:**

1. Allowable spacing is based on capacities determined in AISI 2012, North American Specification for the Design of Cold-Structural Members and ADM 2010, Aluminum Design Manual.

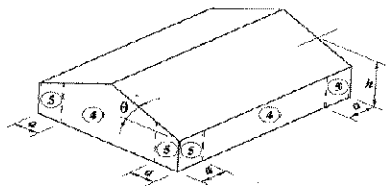
2. Allowable spacing is based on an applied load determined using ASCE 7-10 for the wind speeds and Wind Exposures tabulated. Assumptions include a tributary area of 10 square feet, an Enclosed building, a Topographic Factor of 1.0 and panel bearing length of 2.5 inches.

3. Allowable spacing is determined using the IBC 2015 suction and pressure, the combination is 0.6W.

4. Testing is the basis for the load carrying capacity.

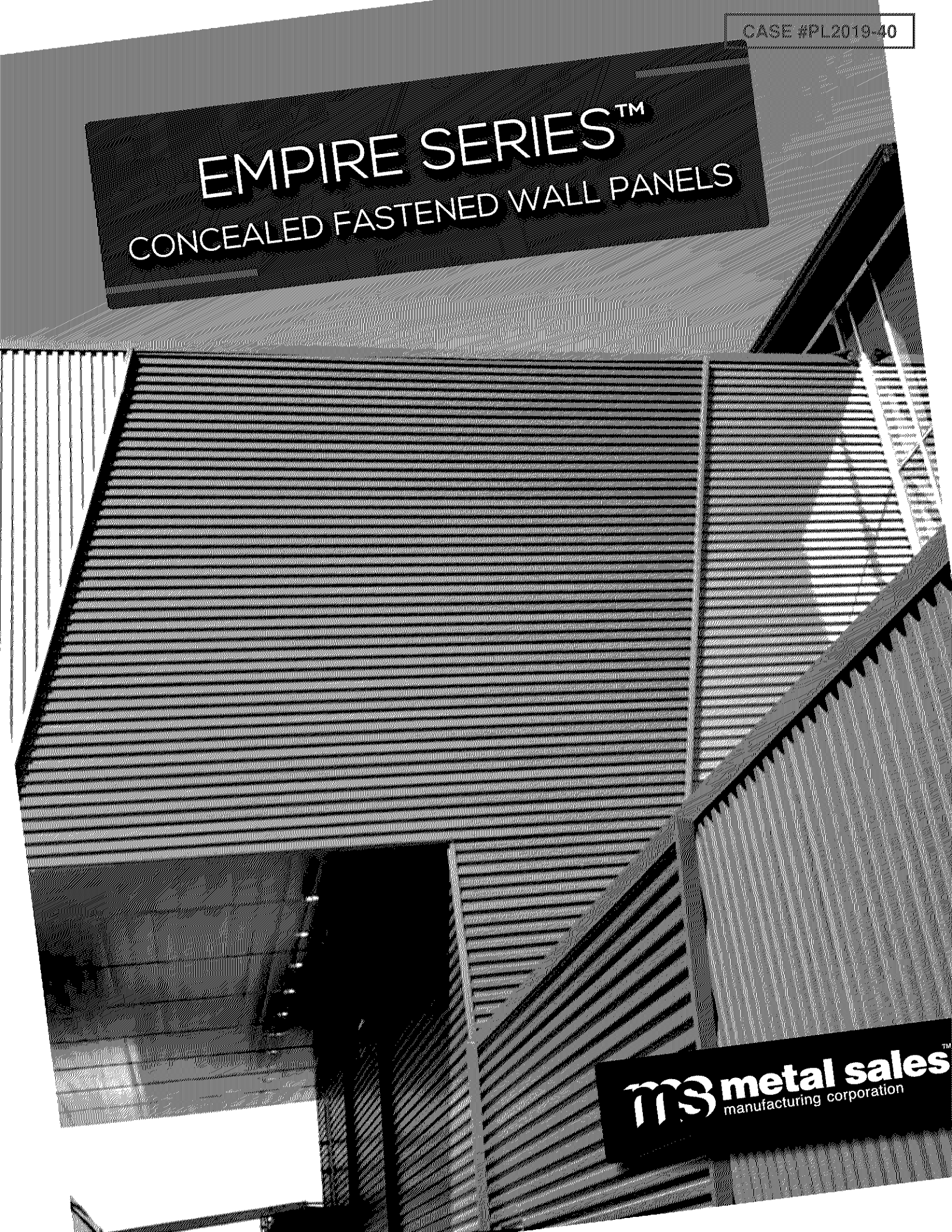
④ - FIELD
⑤ - EDGE

a - LEAST OF 10% MINIMUM BUILDING WIDTH OR 10% OF MEAN ROOF HEIGHT BUT NOT LESS THAN 3'.



# EMPIRE SERIES™

## CONCEALED FASTENED WALL PANELS



metal sales™ manufacturing corporation

# CONCEALED FASTENED WALL PANELS

## EMPIRE SERIES™

**Box Rib**

### Features

- 24 ga. standard, 22 ga. optional
- Vertical and Horizontal installation
- Box rib profile offers a unique combination of bold, clean, symmetrical lines
- High-strength clip attachment allows thermal and seismic movement

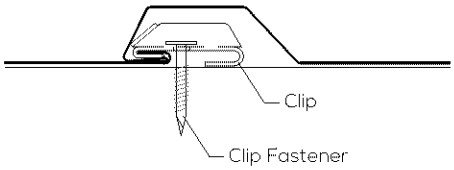
### Benefits

- Wide variety of configurations creating unique shadow lines
- A wide variety of profiles offers a greater range of design flexibility
- Complete control of finished aesthetics
- Rain-screen ready

### Testing

- ASTM E 283, 331 Air & Water Penetration
- ASTM E 1592 Load Testing
- ASTM E 330 Load Testing

### Clip Attachment Detail

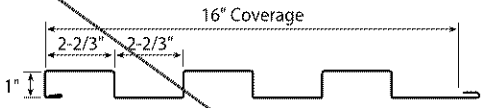


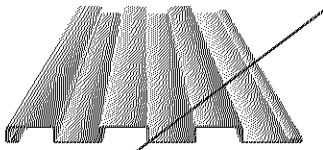

SIDING 5A (20GA) AND 5D (22GA)

### EM1-1212




### EM1-1653



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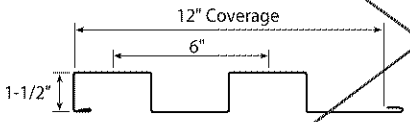


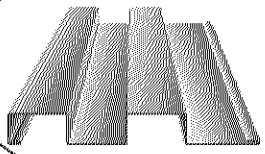

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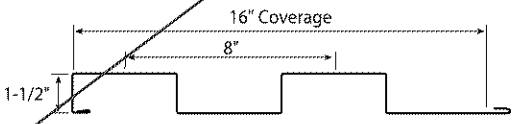


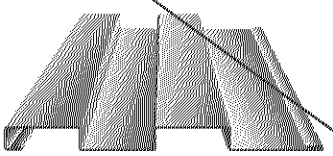

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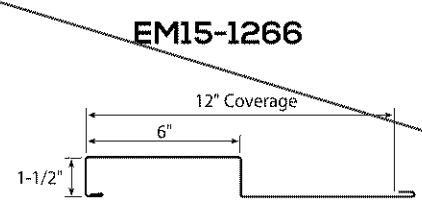


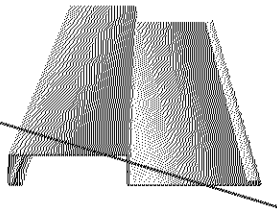

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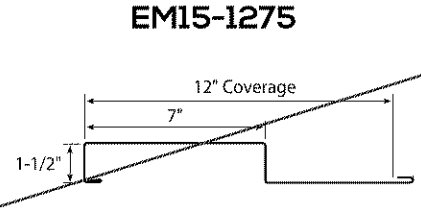


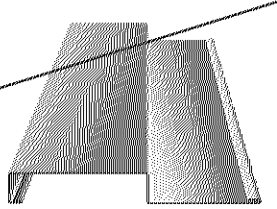

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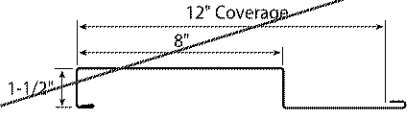


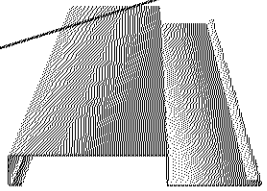

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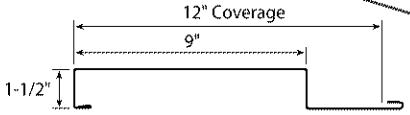
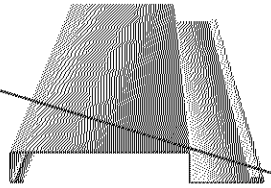


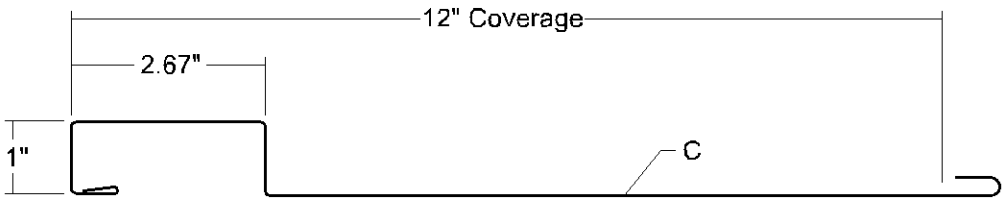



# EM1-1212 CF WALL

**Condensed Technical Reference**

**EMPIRE SERIES™**

CASE #PL2019-40




**ARCHITECTURAL COMMERCIAL INDUSTRIAL PANEL** | **CONCEALED FASTENERS** | **12" COVERAGE** | **WALL AND LINER PANEL** | **OPEN FRAMING OR SOLID SUBSTRATE**

## PANEL OVERVIEW

- Finish: Standard: PVDF and Acrylic-Coated Galvalume®
  Optional: multi-pass Kynar 500® and Fluropon® PURE
- Corrosion Protection: AZ50 per ASTM A 792 for Painted Galvalume®
  AZ55 per ASTM A 792 for Acrylic-Coated Galvalume®
  G90 per ASTM A 653 for Painted Galvanized
- Gauges: 24 ga standard; 22 ga and 20 ga optional
- 12" panel coverage, 1" panel height, 12" rib spacing
- Clip-attached, concealed-fastened panel system
- Panel Length: 5' minimum, 30' maximum
- Panels can be installed horizontally or vertically
- Panels are interchangeable for accent effects
- Use on single-skin or field-assembled wall systems

## TESTING

- ASTM E 283 Air Leakage
- ASTM E 331 Water Penetration
- ASTM E 330 Load Test
- ASTM E 1592 Load Test

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# EM1-1212 CF WALL

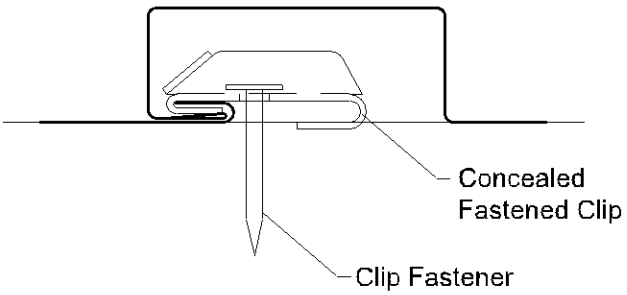
Condensed Technical Reference

Stamp

in johnson

## PANEL ATTACHMENT

CASE #PL2019-40




## FASTENING INFORMATION

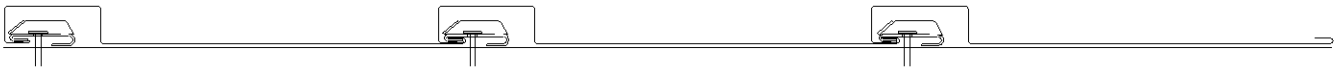
- Concealed Fastened Clip is 3" x 1-3/4" x 3/4", from 16 ga. G90 material with 2 fastener holes.
- Clip Fasteners should be driven just to contact between fastener head / clip / panel / support. Beyond contact, the clip can crush the open hem of the panel and make engagement of the next panel difficult. Overdriven fasteners will cause panel distortions.
- Fasteners should extend 1/2" or more past the inside face of the support material for steel and wood sheathing support materials.
- Clip Fasteners:
  - Attaching to Wood:
    - #12-11 Low Profile Wood Screw
  - Attaching to Steel:
    - < 18 ga: 1/4"-13 Deck Screw
    - ≥ 18 ga, ≤ 12 ga: #10-16 Pancake Head Driller
    - > 12 ga: 1/4"-14 Self Driller, No Washer

## INSTALLATION DIRECTION

Horizontally-oriented panels must be installed from the bottom to the top.

Vertically-oriented panels may be installed from the right-to-left or left-to-right.

Left-to-Right Installation of Vertically-Oriented Panels



Right-to-Left Installation of Vertically-Oriented Panels

## SECTION PROPERTIES

## ALLOWABLE UNIFORM LOADS, psf For various fastener spacings

| Ga | Width in | Yield ksi | Weight psf | Top In Compression | | Bottom In Compression | | Inward Load | | | | | Outward Load | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Ixx in⁴/ft | Sxx in³/ft | Ixx in⁴/ft | Sxx in³/ft | 2' | 3' | 4' | 5' | 6' | 2' | 3' | 4' | 5' | 6' |
| **24** | 12 | 50 | 1.25 | 0.0297 | 0.0355 | 0.0291 | 0.0574 | 120 | 97 | 69 | 44 | 23 | 70 | 58 | 45 | 33 | 21 |
| **22** | 12 | 50 | 1.66 | 0.0442 | 0.0538 | 0.0410 | 0.0783 | 120 | 97 | 71 | 47 | 23 | 70 | 58 | 45 | 33 | 21 |
| **20** | 12 | 33 | 2.00 | 0.0635 | 0.0799 | 0.0550 | 0.0966 | 120 | 97 | 71 | 47 | 23 | 70 | 58 | 45 | 33 | 21 |

1. Theoretical section properties have been calculated per AISI 2016 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable load is calculated in accordance with AISI 2016 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal spans condition. Allowable load does not address web crippling, fasteners, support material or load testing. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase for wind.



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Fontana, CA 800.782.7953
Fort Smith, AR 877.452.3915
Independence, MO 800.747.0012
Jacksonville, FL 800.394.4419
Jefferson, OH 800.321.5833
Mocksville, NC 800.228.6119
Nashville, TN 800.251.8508
Rock Island, IL 800.747.1206
Rogers, MN 800.328.9316
Seattle, WA 800.431.3470
Sellersburg, IN 800.999.7777
Sioux Falls, SD 888.299.0024
Spokane, WA 800.572.6565
Temple, TX 800.543.4415
Woodland, CA 800.759.6019

## Metal Sales Manufacturing Corporation

# PVDF Fluorocarbon System Warranty

Metal Sales Manufacturing Corporation warrants that under normal outdoor atmospheric conditions (which term excludes corrosive aggressive atmospheres such as those contaminated with chemical fumes or salt spray), the exterior paint on the pre-painted Galvanized, Galvalume®, or Aluminum panel (including manufactured trims and flashings) sold to you (Buyer), by Metal Sales Manufacturing Corporation (Seller), will meet the following specifications:

Within the Continental United States, Alaska and Canada:

| | |
|---|---|
| Film Integrity: | Film integrity is warranted for a period of 45 years. Fluorocarbon coated panels will not crack, flake, chip, or peel (not to be construed to include slight hairline crazing which occurs during fabrication) for a period of 45 years. Distance from salt water environment must exceed 1500 feet for warranty to apply. |
| Chalk Rating: | Will not chalk in excess of number 8 rating on applications for a period of 35 years as determined by the procedure outlined in ASTM D 4214 Method A, ASTM D 659 specification test. Distance from salt water environment must exceed 1500 feet for warranty to apply. |
| Fade Rating: | Will not fade in excess of more than 5 Hunter units for a period of 35 years as determined by ASTM D 2244. Distance from salt water environment must exceed 1500 feet for warranty to apply. |
| Perforation: | AZ50 Galvalume-coated steel will not rupture, perforate or fail structurally due to perforation for a period of 25 years. |

This warranty is subject to the following conditions:

1. Panels shall be warranted only if they have sufficient slope to prevent the accumulation of standing water.

2. Buyer shall exercise diligence in inspection of material as received from Seller prior to utilization so as to mitigate expense involved in repainting or replacing nonconforming panels.

3. Claim Period and Duties of Buyer in Presenting Claims. Claims for all defects must be made within the warranty period and within thirty (30) days after Buyer discovers the nonconforming panel, and Buyer must give Seller a reasonable opportunity to inspect the material. As a condition precedent to Seller's liability hereunder, Buyer must present, with his claim, records to enable Seller to establish the order number, date of shipment and the date of installation for the claimed nonconforming panel. These records must be duly authenticated, be made in the ordinary course of business and be contemporaneous with the events noted therein. Buyer shall also present evidence that establishes any claimed nonconformance was due to a breach of the warranty stated herein.

4. Amount of Liability. Seller's liability for breach of this warranty shall be limited to repainting or replacing of the nonconforming panel utilizing such normal materials, methods and workmanship necessary to provide the stipulated performance remaining under the original warranty for the nonconforming panel. Seller shall have the sole discretion to determine which of the above methods will be used to fulfill its obligation. Seller shall have no liability or obligation whatsoever if payment in full has not been made for any materials. Moreover, if Seller elects to supply replacement panels, Seller shall have no liability for labor costs associated with removing defective panels or replacing same with new panels.

Seller's warranties apply only to panels which have been exposed to normal weather and atmospheric conditions, is limited to the aforementioned defects or failures, and does not apply to defects or failures caused by acts of God, falling objects, misuse, improper assembly, external forces, explosions, fire, vandalism, deliberate destruction or damage, riots, civil commotions, acts of war, radiation or harmful gases or fumes, excessive salt atmospheres, chemicals and foreign substances (i.e., abnormal quantities of sand or dirt particles) in the air or atmosphere, stored or installed in a way which allows contact with animal and/or animal waste and regardless of roof or sidewall pitch, installation must provide for proper drainage so as not to hold any water. Seller's warranty does not apply to panels that have been mechanically perforated or field painted.

This warranty does not cover failures resulting from edge corrosion or failure caused by failure of the metal substrate or conversion coating material. This warranty does not cover occurrences of wet storage stains. Contact with a dissimilar metal such as copper or water containing a dissimilar metal is not covered.

Seller shall not be liable for any special or consequential damages except as may be expressly set out herein. Without limiting the generality of the foregoing, this warranty pertains to product only, and Seller shall not be liable for damages for or relating to labor or loss of use of structure or damage to contents of structure.

5. Transfers, Representations and Assignments. This warranty is extended to Buyer as the original purchaser from Seller and is nontransferable and non-assignable even if Seller's products are sold or otherwise transferred. No rights against Seller shall be created by a transfer or assignment, nor shall any rights against Seller survive any transfer or assignment. Buyer, or its agents or representatives, shall not claim, represent or imply nor permit its customers, distributors, applicators or contractors to claim, represent or imply that this warranty extends or is available to parties other than Buyer, and to the limit of its legal rights to do so, Buyer shall cause any party to cease and desist in any such misrepresentation. This condition shall constitute a material term of this warranty and its violation by Buyer shall excuse Seller from its obligations hereunder.

6. Termination. Seller reserves the right to terminate or modify this warranty except with respect to orders which it has already accepted upon the giving of written notice thereof.

7. Waiver of Modification of Seller's Rights. No terms or conditions, other than those stated herein, and no agreement or understanding oral or written, and no course of conduct or performance, in anyway purporting to modify this warranty or to waive Seller's rights hereunder, shall be binding on Seller unless the same be clearly described in a writing that expressly refers to this warranty and expressly refers to having such effect upon this warranty and is signed by an authorized representative of Seller. Moreover, additional liabilities of or limitations upon the rights and remedies of Seller contained in such documents as purchase order acknowledgments which may subsequently be exchanged between parties shall have no force upon this warranty. All proposals, negotiations and representations, if any, made prior to or with reference hereto are merged herein.

8. Materiality and General Obligation of Buyer. All obligations of and conditions imposed on Buyer under this warranty shall be deemed material terms of this warranty and any violation by Buyer shall excuse Seller from Seller's obligation hereunder.

9. Embossed Products. Seller makes no warranties regarding any embossed product and no warranties of such product may be implied.

10. Effective Date. The effective date of this warranty shall be the date on which Buyer takes possession of Seller's product.

11. Merger or Other Warranties, Including Merchantability. All other warranties, promises or affirmations of fact including warranties of merchantability and of fitness for a particular purpose are deemed to be merged into the terms of this warranty. The conditions of liability, rights, obligations, and remedies of the parties relating to claims arising from the nonconforming panel shall be governed exclusively by the terms set forth above.

12. Coverage. This warranty will apply only to metal coated with fluorocarbon finish and used on property within the continental United States, Canada and Alaska.

13. This Warranty does not cover special colors and/or finishes listed on the Custom PVDF System Warranty.

EXCEPT AS EXPRESSLY SET OUT HEREIN, METAL SALES MANUFACTURING CORPORATION MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED AND DISCLAIMS ANY AND ALL INCLUDING, BUT NOT LIMITED TO ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY, SUITABILITY, CONDITION, FITNESS, QUALITY, FITNESS FOR A PARTICULAR PURPOSE, ABSENCE OF PATENT OR LATENT DEFECTS IN MATERIAL OR WORKMANSHIP, COMPLIANCE WITH THE REQUIREMENTS OF ANY LAW, REGULATIONS, SPECIFICATIONS OR CONTRACTS, OR ANY OTHER OBLIGATION ON THE PART OF METAL SALES MANUFACTURING CORPORATION.

Agreed Procedure for Determining Conformation with Specification
For the purpose of determining whether an exposed panel meets the standards set forth above, all chalk, dirt and other film deposits on the area of the panel to be tested for color must be removed by washing prior to evaluation.

To wash the test area, use a pad of 28/24 mesh cheesecloth and distilled water and a mild detergent cleaner. Wet the cheesecloth thoroughly with the cleaning solution and rub it, using moderate hand pressure, over an area of the panel approximately 4" x 4". Care must be taken to avoid any scratching, burnishing or other physical alteration of the coated surfaces.

After washing, as described above, flush off the test area with distilled water and allow to air dry.

Failure to keep condensation or moisture from nested materials may result in damage or wet storage stain, voiding manufacturer's guarantee.

---

If project requires a material/finish warranty to be issued, completely fill out information below and submit to Metal Sales customer.

Project Name: _____

Project Address: _____

Owner Name: _____

Installer Name: _____

MSMC Invoice: _____

MSMC TSM Signature: _____ Date: _____

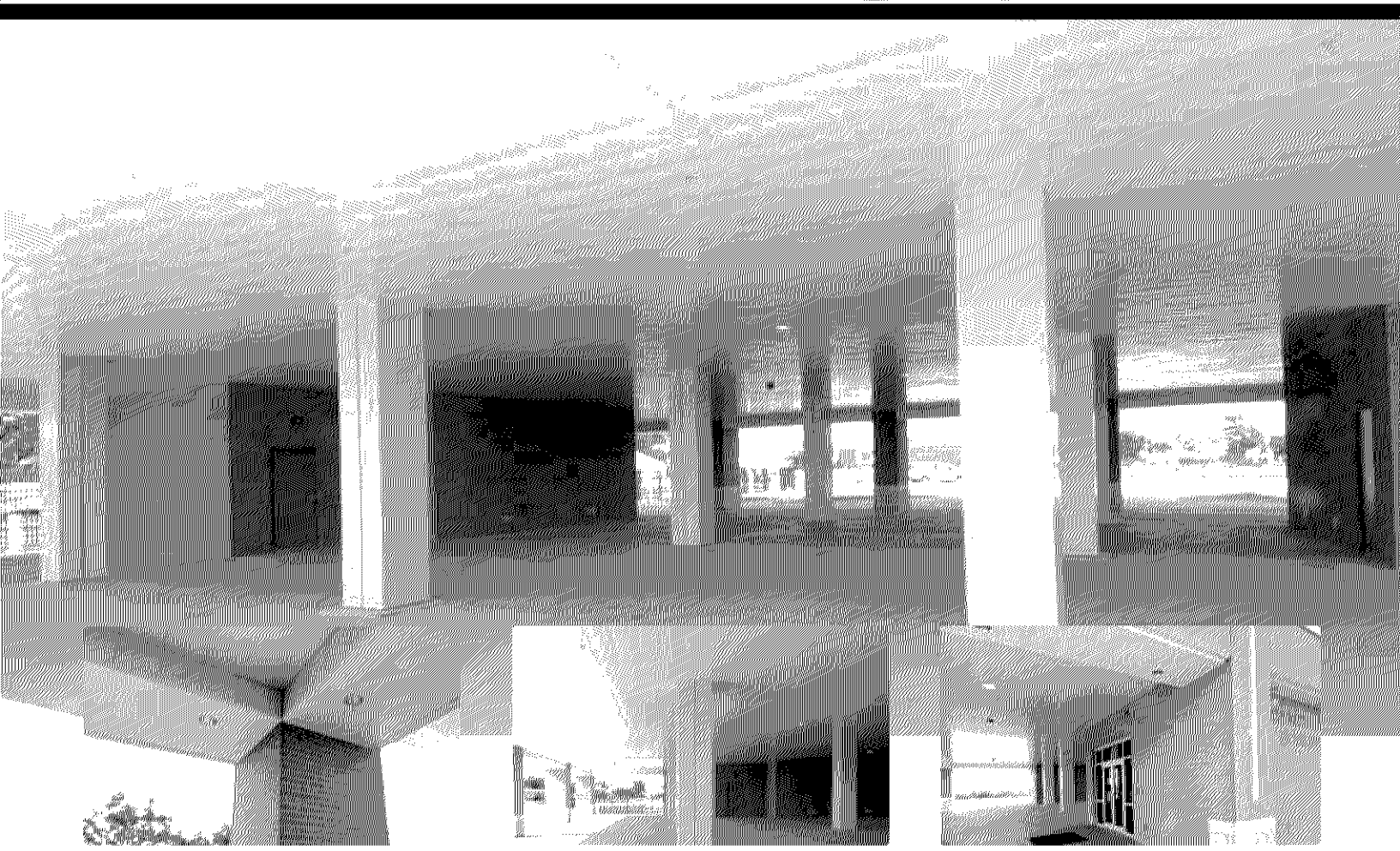
metal sales
manufacturing corporation

Metal Sales Manufacturing Corporation
545 South 3rd Street
Suite 200
Louisville, KY 40202
800.406.7387

Effective Date 5/13

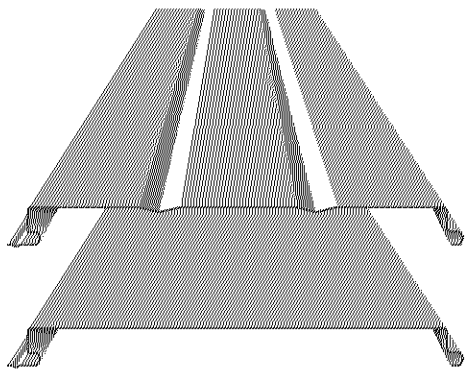
# Soffit Panel

## Metal Sales Manufacturing Corporation



## Metal Soffit, Wall and Liner Panel

- Choose from PVDF, MS Colorfast45® or Acrylic Coated Galvalume®
- Available in a wide variety of ENERGY STAR® listed colors
- Applies over solid substrate or open framing
- Lanced Soffit Panel for venting available
- Tongue and groove side lap installation
- 24 gauge and 26 gauge



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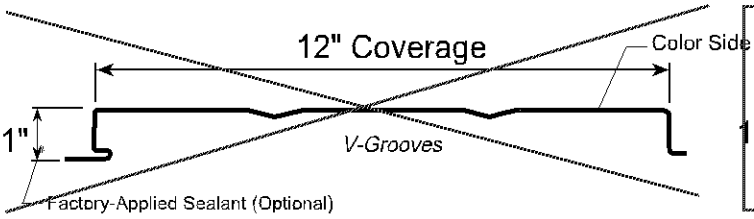
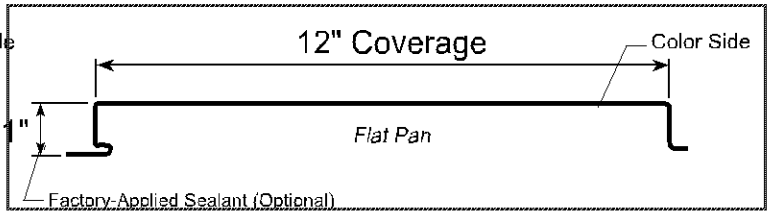
CASE #PL2019-40

# SOFFIT PANEL

SIDING 5B

## Profile

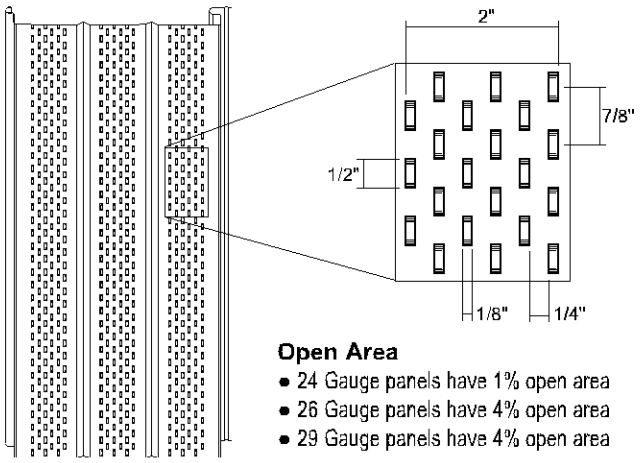



## Panel Information

- ▶ Concealed, direct-fastened panel
- ▶ Soffit, wall, fascia or liner applications
- ▶ V-Groove, Solid, and Lanced profiles available
- ▶ Gauges: 24 ga. and 26 ga. 20 GA.
- ▶ 45 year paint warranty

## Lanced Soffit Panel Pattern




**Open Area**

- 24 Gauge panels have 1% open area
- 26 Gauge panels have 4% open area
- 29 Gauge panels have 4% open area

## General Information

▶ Substructure: Soffit Panel is designed to be utilized over open structural framing or a solid substrate. To avoid panel distortion, use a properly aligned and uniform substructure.

▶ Length: Minimum factory cut length is 2'-0".
24 Ga. maximum recommended panel length is 20'-0"
26 Ga. maximum recommended panel length is 20'-0"
29 Ga. maximum recommended panel length is 20'-0"

▶ Finishes: Acrylic Coated Galvalume®, MS Colorfast45® or PVDF colors.

*For all specific warranty, application, installation, and technical information regarding these products, contact your Metal Sales representative.*

## Testing and Approvals

- ▷ ASTM E 263, Fire Resistance Rating - per assembly
- ▷ ASTM E 283 Air Infiltration
- ▷ ASTM E 330 Uniform Static Air Pressure Difference
- ▷ ASTM E 331 Water Penetration
- ▷ 2014 FBC Approved:
  –24 ga. over 16 ga. Purlins 9482.5

## Load Table

| SECTION PROPERTIES | | | | | | | | ALLOWABLE UNIFORM LOADS, psf For various fastener spacings | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ga | Width in | Yield ksi | Weight psf | Top In Compression | | Bottom In Compression | | Inward Load | | | | | | Outward Load | | | | | |
| | | | | Ixx in⁴/ft | Sxx in³/ft | Ixx in⁴/ft | Sxx in³/ft | 2' | 2.5' | 3' | 3.5' | 4' | 5' | 2' | 2.5' | 3' | 3.5' | 4' | 5' |
| 26 | 12 | 50 | 0.94 | 0.0130 | 0.0226 | 0.0290 | 0.0339 | 133 | 95 | 71 | 55 | 43 | 32 | 106 | 73 | 53 | 40 | 31 | 23 |
| 24 | 12 | 50 | 1.23 | 0.0189 | 0.0338 | 0.0410 | 0.0480 | 179 | 129 | 97 | 75 | 60 | 40 | 150 | 104 | 76 | 58 | 45 | 30 |
| 22 | 12 | 50 | 1.62 | 0.0278 | 0.0520 | 0.0560 | 0.0651 | 234 | 170 | 129 | 100 | 80 | 54 | 212 | 151 | 112 | 86 | 68 | 45 |

1. Theoretical section properties have been calculated per AISI 2007 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable load is calculated in accordance with AISI 2007 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal spans condition. Allowable load does not address web crippling, fasteners, support material or load testing. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase for wind.



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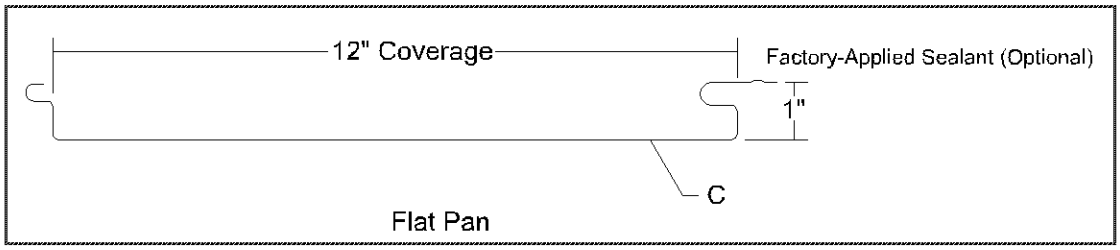
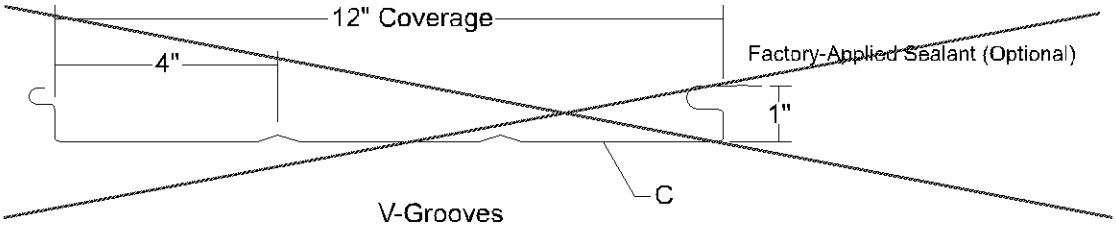
Temple, TX: 800.543.4415
Woodland, CA: 800.759.6019

# SOFFIT PANEL

**Condensed Technical Reference**



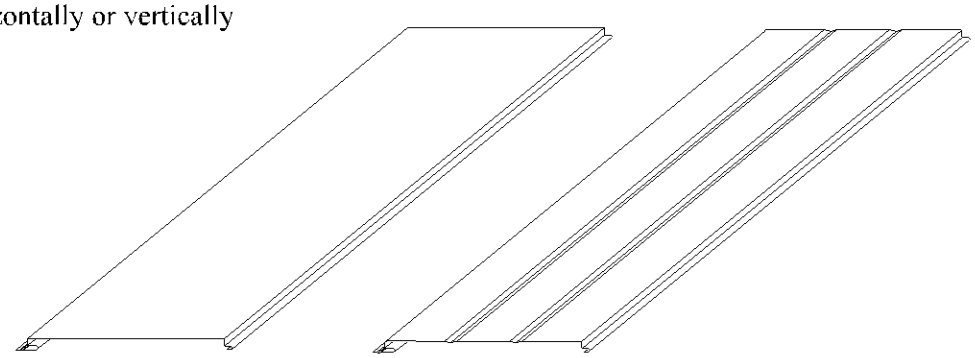




**ARCHITECTURAL COMMERCIAL INDUSTRIAL PANEL** | **CONCEALED FASTENED** | **12" COVERAGE** | **SOFFIT, FASCIA, WALL OR LINER APPLICATIONS** | **OPEN FRAMING OR SOLID SUBSTRATE**

## PANEL OVERVIEW

CASE #PL2019-40

- Finishes: Standard:PVDF, MS Colorfast45® and Acrylic-Coated Galvalume®
- Corrosion Protection: AZ55 per ASTM A 792 for unpainted Galvalume®
  AZ50 per ASTM A 792 for painted Galvalume®
  G90 per ASTM A 653 for Galvanized
- Gauges: 26 ga and 24 ga and 22 ga 20 GA.
- 12" panel coverage, 1" panel depth
- Panel Length: 26 ga: 5' maximum and 5' minimum
  24 ga: 20' maximum and 5' minimum
  22 ga: 20' maximum and 5' minimum
- Applies over open framing or solid substrate
- Concealed, direct fastened panel for soffit, fascia, wall and liner applications
- Panels can be installed horizontally or vertically
- Tongue-and-groove sidelap



## TESTING AND APPROVALS

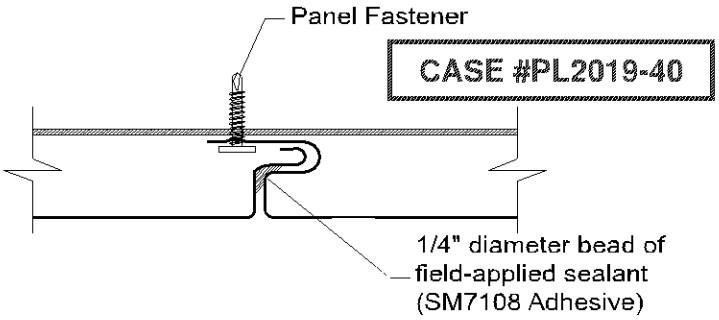
- UL 263 Fire Resistance Rating - per assembly
- ASTM E 283 Air Leakage - 0.25 cfm/ft² at 6.24 psf
- ASTM E 331 Water Penetration - none at 12 psf
- ASTM E 330 Structural Performance
- 2017 FBC Approval - FL9482.5

MS metal sales™ manufacturing corporation

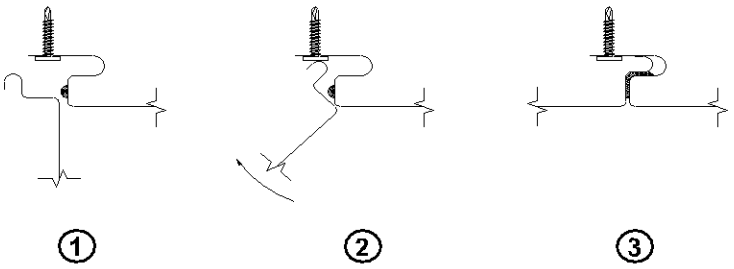
# SOFFIT PANEL

**Condensed Technical Reference**

### SIDELAP FASTENING DETAIL




### SIDELAP INSTALLATION




### FASTENER INFORMATION

Overdriven fasteners will cause panel distortions.

Fasteners should extend 1/2" or more past the inside face of the support material.

Thick panels (ex. 18 ga) or supports (ex. 1/2" steel) may require predrilling of holes for screws.

Panel Fasteners:
- Attaching to Wood:
  - #10-12 Pancake Head Wood Screw
- Attaching to Steel:
  - ≤12 ga: #10-16 Pancake Head Driller

Trim Fasteners:
- 1/4"-14 x 7/8" XL Stitch Screw
- 1/8" x 3/16" Pop Rivet

Field-Applied Sealant:
- 1/4" bead of SM7108
- Panels must be engaged before sealant has cured.

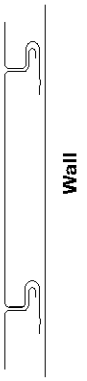
### VERTICAL DIRECTIONAL DETAILS

**Left to Right Installation**

**Right to Left Installation**

### HORIZONTAL DIRECTIONAL DETAIL

**Top to Bottom Installation**




### SECTION PROPERTIES

### ALLOWABLE UNIFORM LOADS, psf
For various fastener spacings

| Ga | Width in | Yield ksi | Weight psf | Top In Compression | | Bottom In Compression | | Inward Load | | | | | | Outward Load | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Ixx in⁴/ft | Sxx in³/ft | Ixx in⁴/ft | Sxx in³/ft | 2' | 2.5' | 3' | 3.5' | 4' | 5' | 2' | 2.5' | 3' | 3.5' | 4' | 5' |
| 26 | 12 | 50 | 0.94 | 0.0130 | 0.0226 | 0.0290 | 0.0339 | 144 | 100 | 74 | 55 | 42 | 27 | - | - | - | - | - | - |
| 24 | 12 | 50 | 1.23 | 0.0189 | 0.0338 | 0.0410 | 0.0480 | 178 | 129 | 97 | 75 | 60 | 40 | 55 | 55 | 55 | 55 | 55 | - |
| 22 | 12 | 50 | 1.62 | 0.0278 | 0.0520 | 0.0560 | 0.0651 | 234 | 170 | 129 | 100 | 80 | 54 | 55 | 55 | 55 | 55 | 55 | - |

1. Theoretical section properties have been calculated per AISI 2016 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable load is calculated in accordance with AISI 2016 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal spans condition. Allowable load does not address web crippling, fasteners, support material or load testing. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase for wind.



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